

NASA Contractor Report 189656, Volume 5

FINAL TECHNICAL REPORT

For

**Support Activities to Maintain SUMS
Flight Readiness**

Contract No. NAS1-17399

**Volume 5 of 9
Attachment B: Flight STS-35 Report
(Section C)**

submitted to

**National Aeronautics and Space Administration
Langley Research Center
Hampton, Virginia 23665-5225**

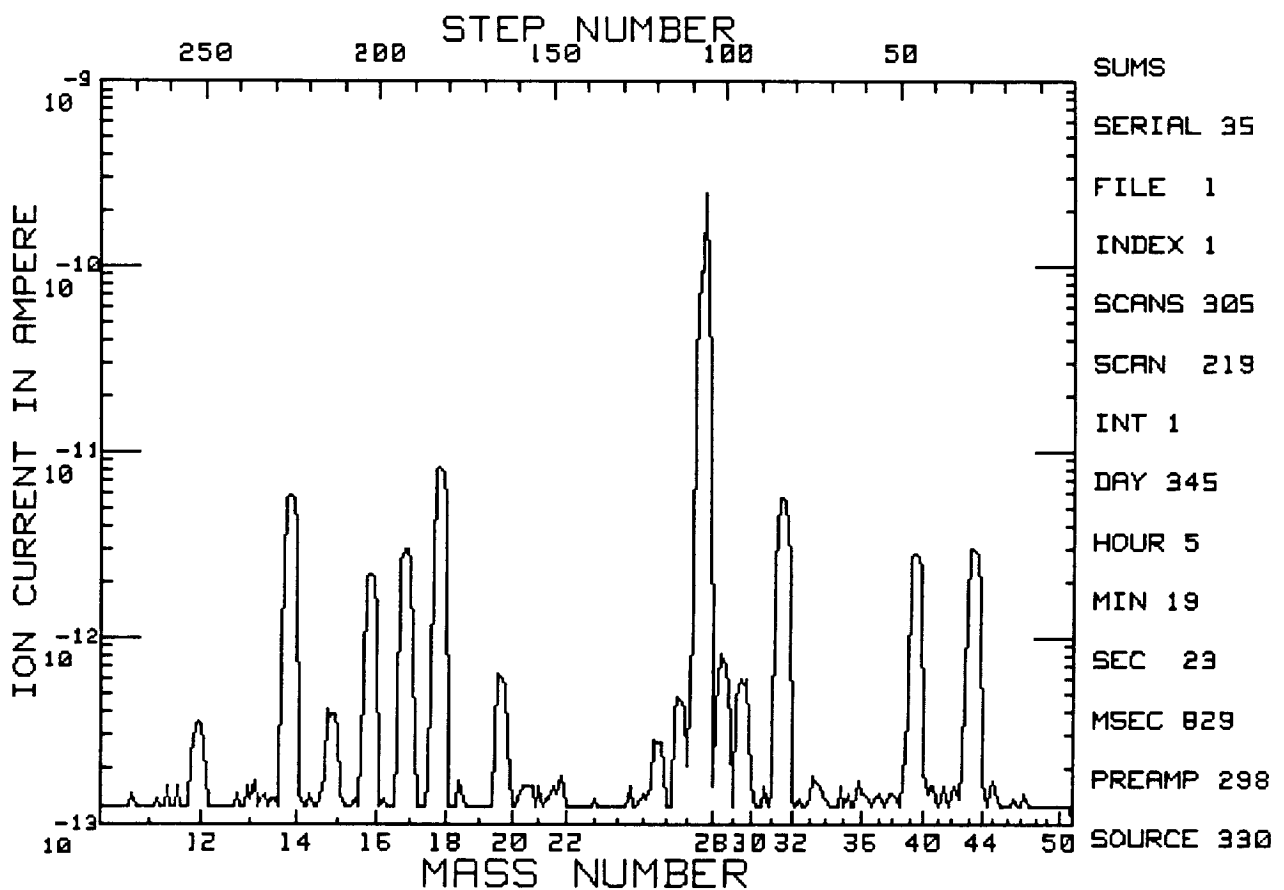
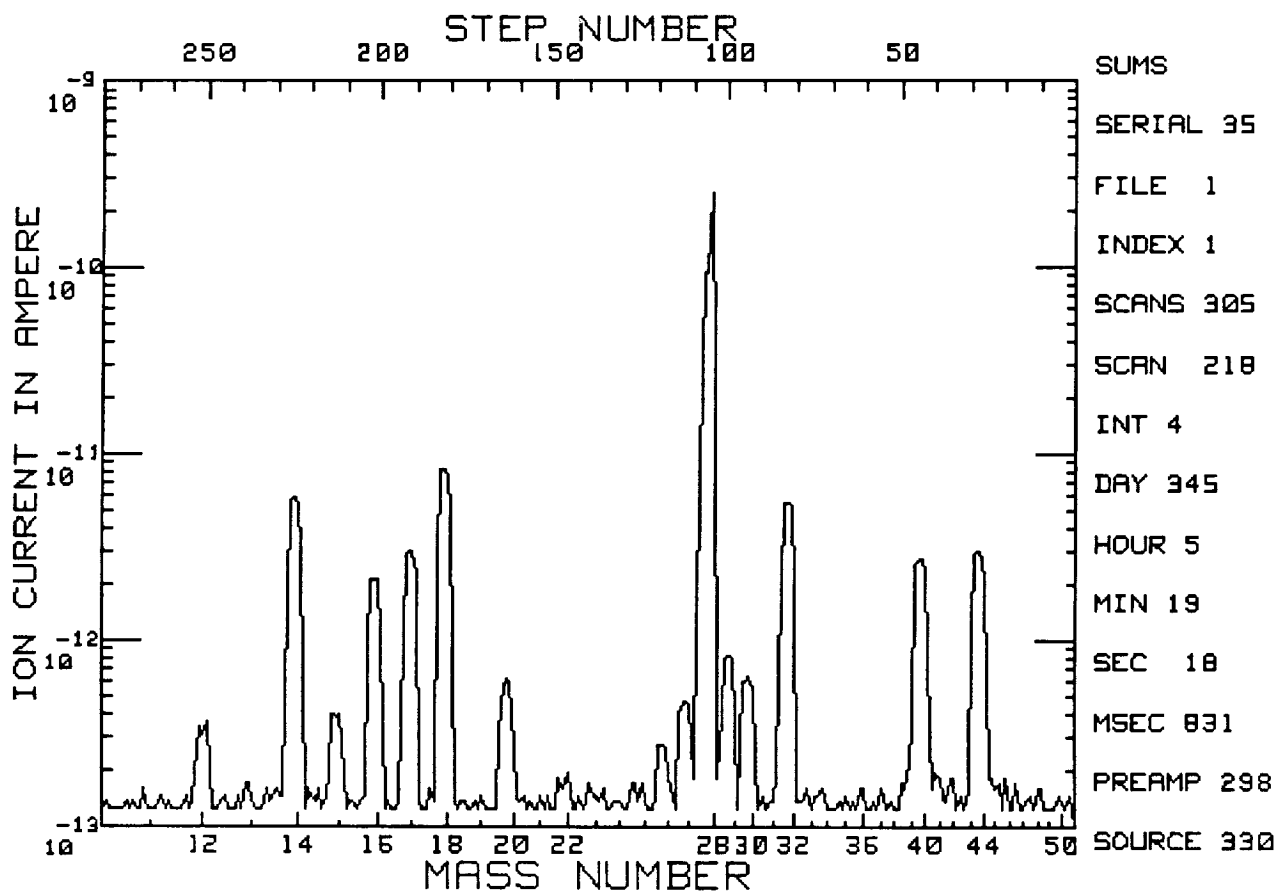
by

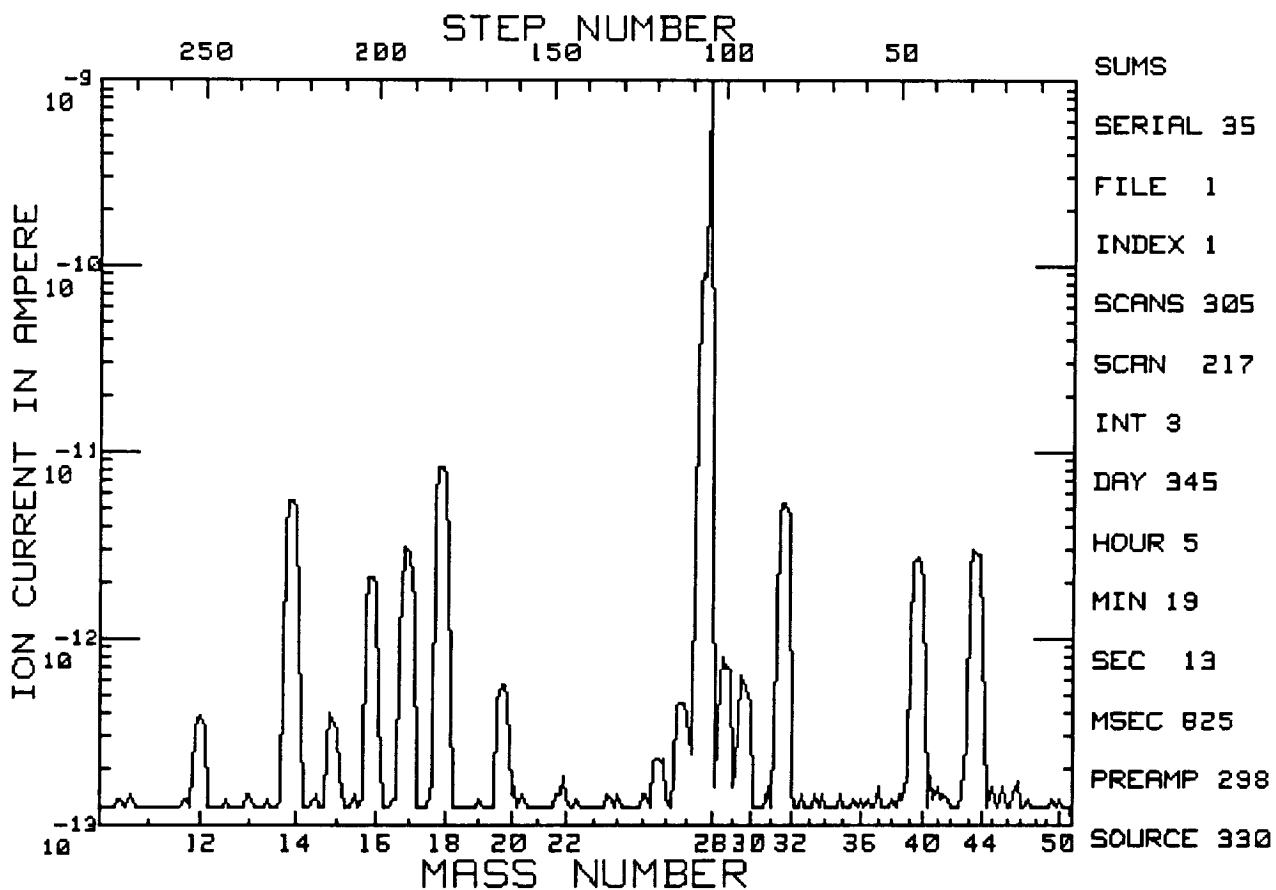
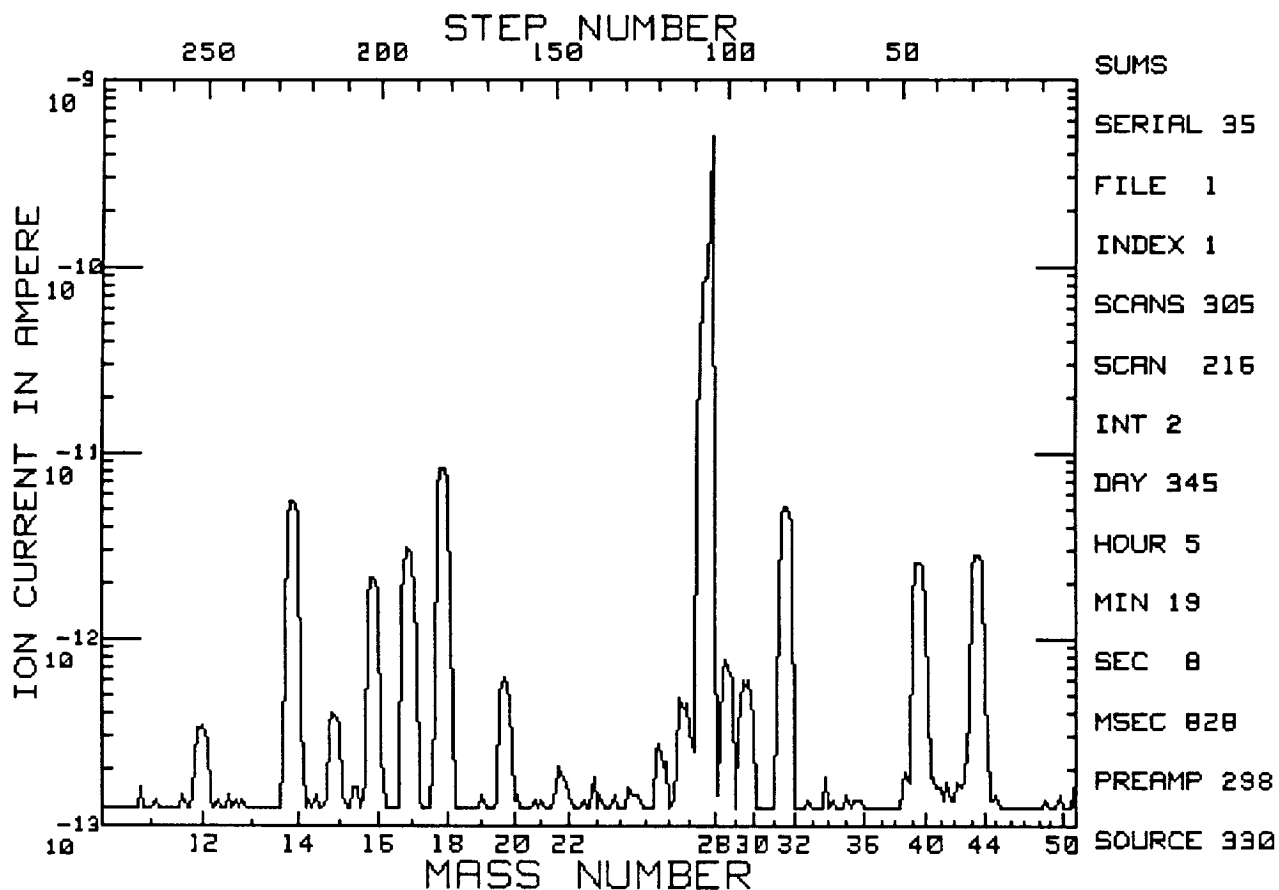
**The University of Texas at Dallas
P.O. Box 830688
Richardson, Texas 75083-0688**

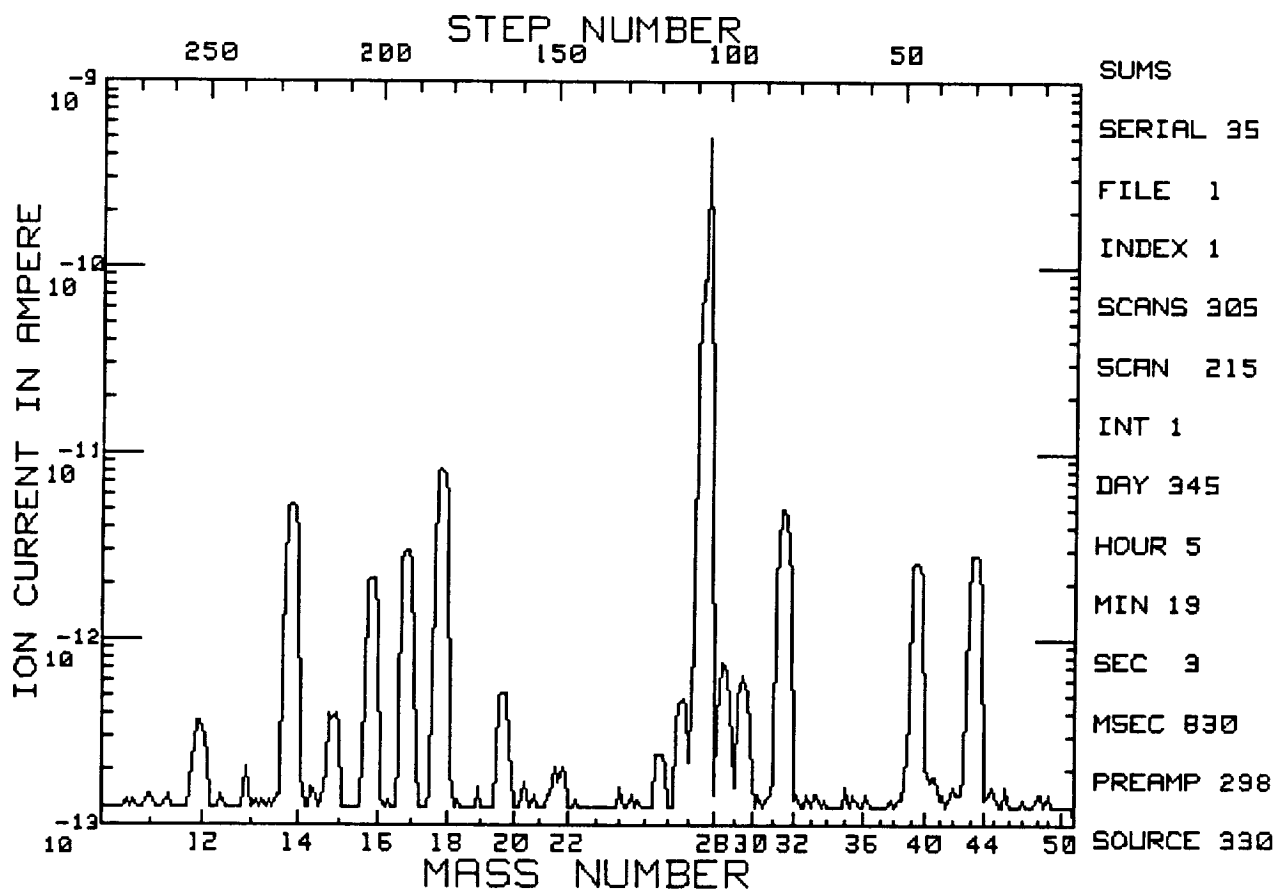
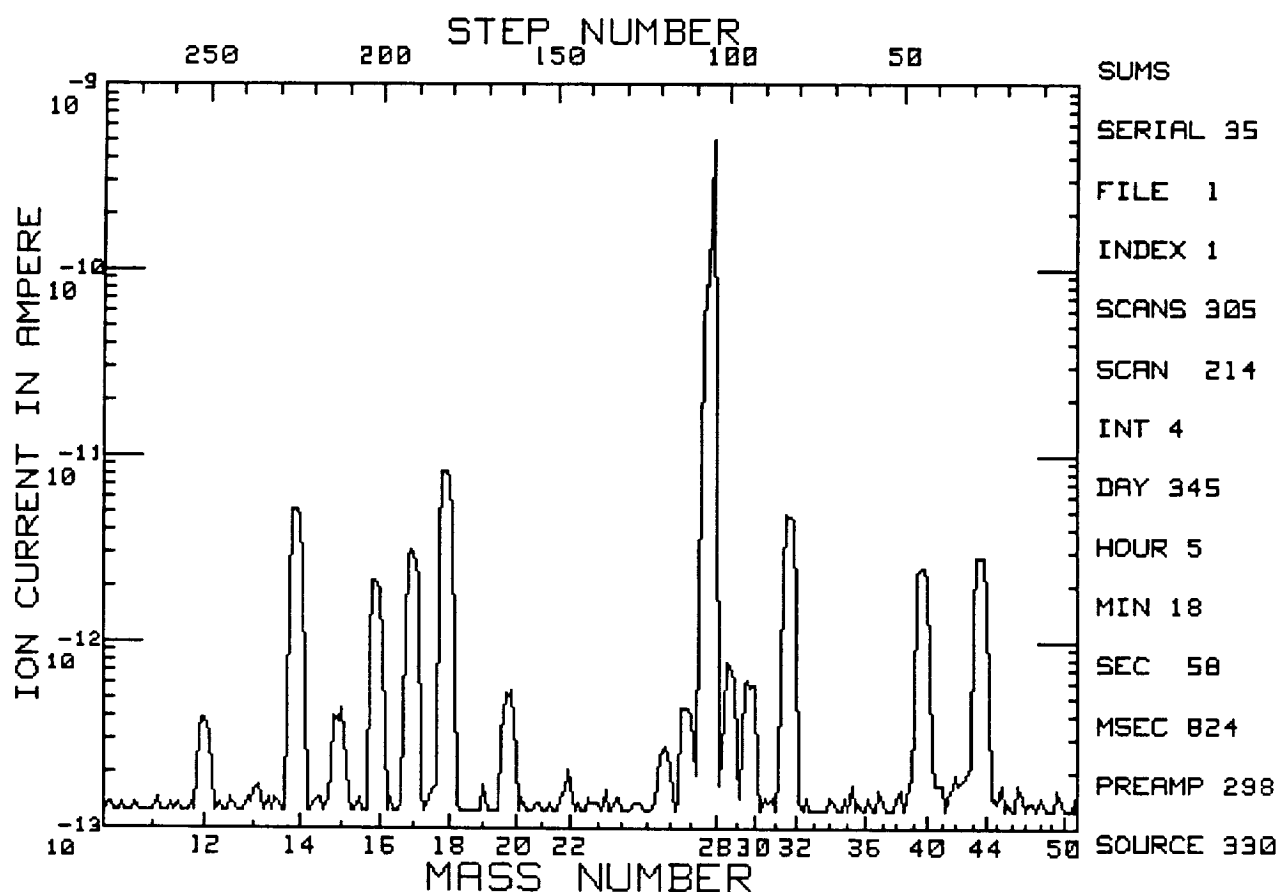
(NASA-CR-189656-Vol-5) SUPPORT ACTIVITIES
TO MAINTAIN SUMS FLIGHT READINESS, VOLUME 5.
ATTACHMENT B: FLIGHT STS-35 REPORT, SECTION
C Final Technical Report (Texas Univ. at
Dallas) 119 p

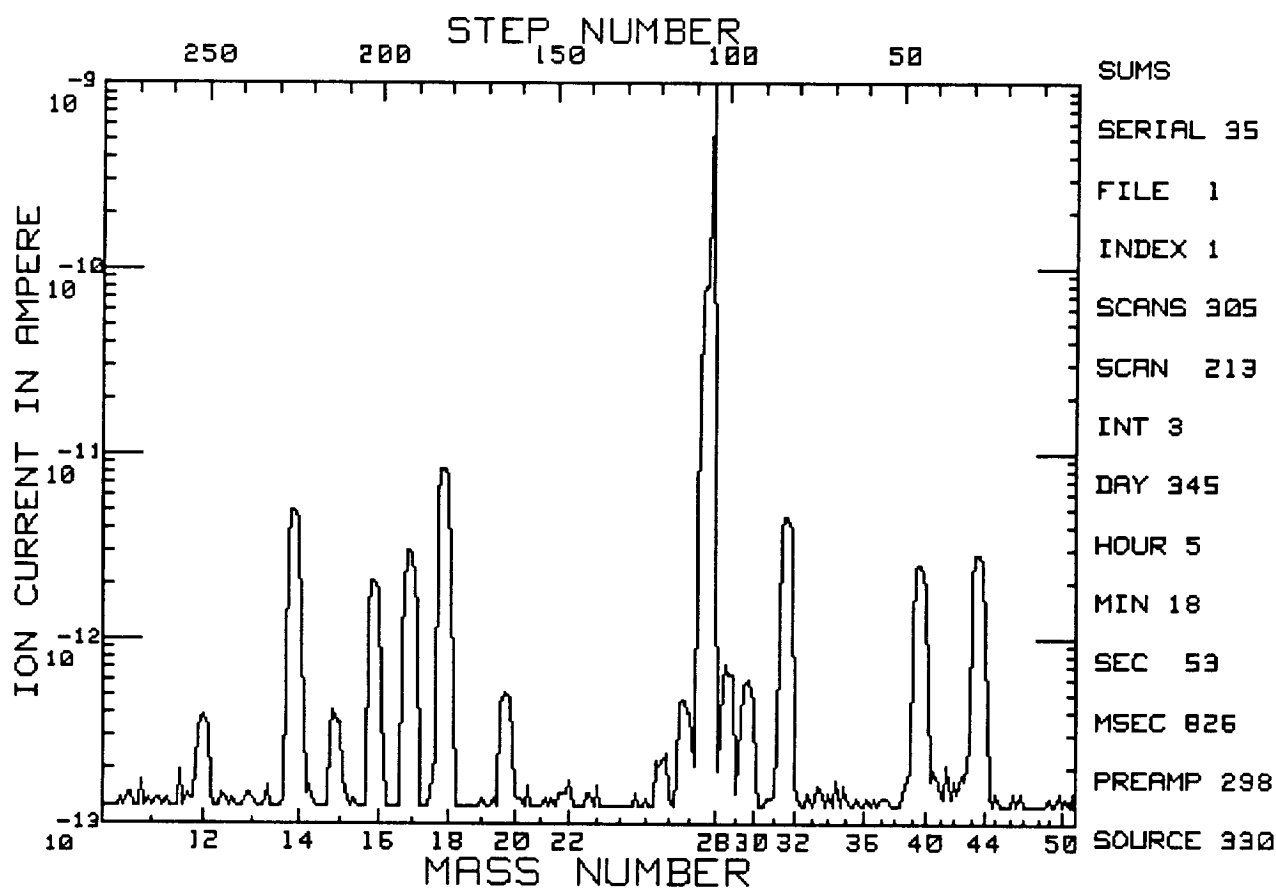
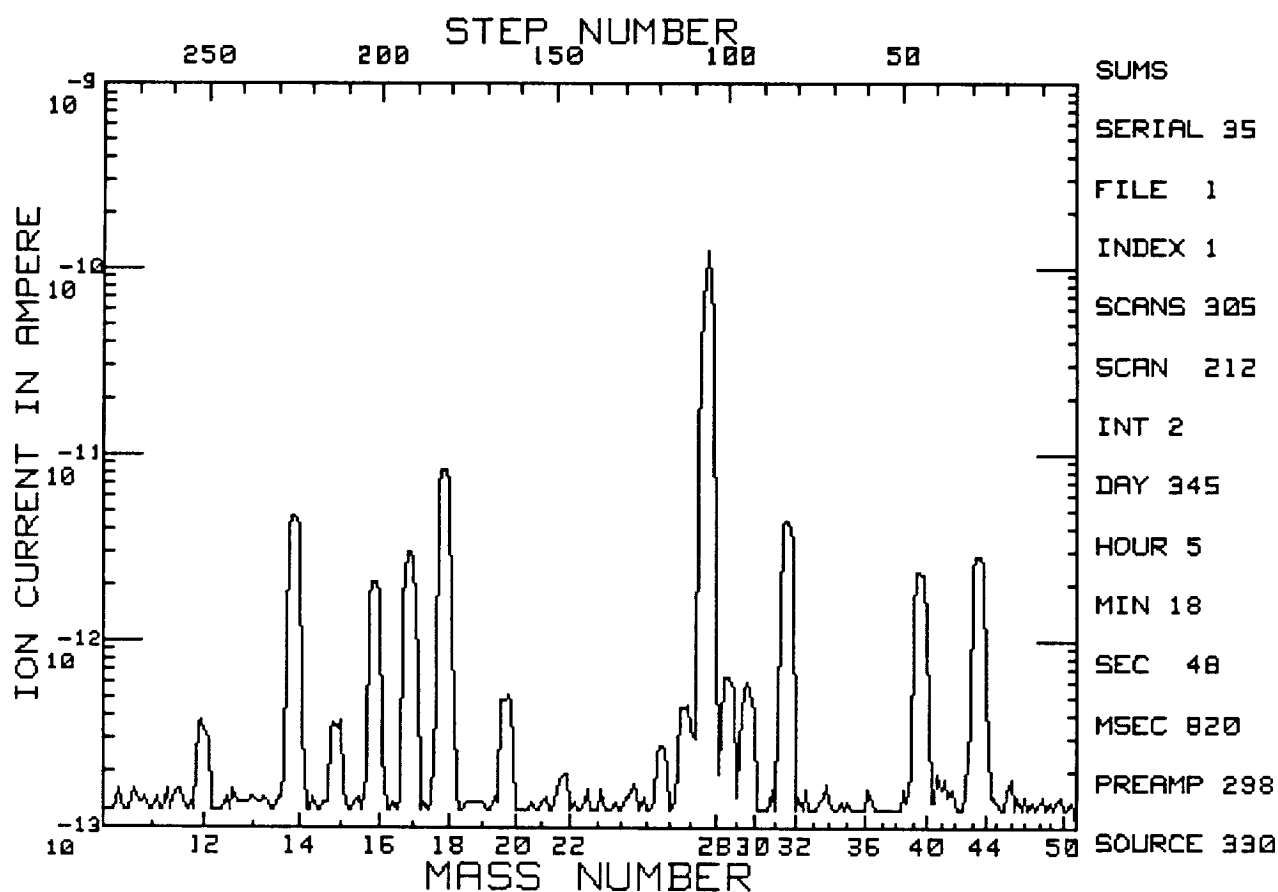
N92-30221

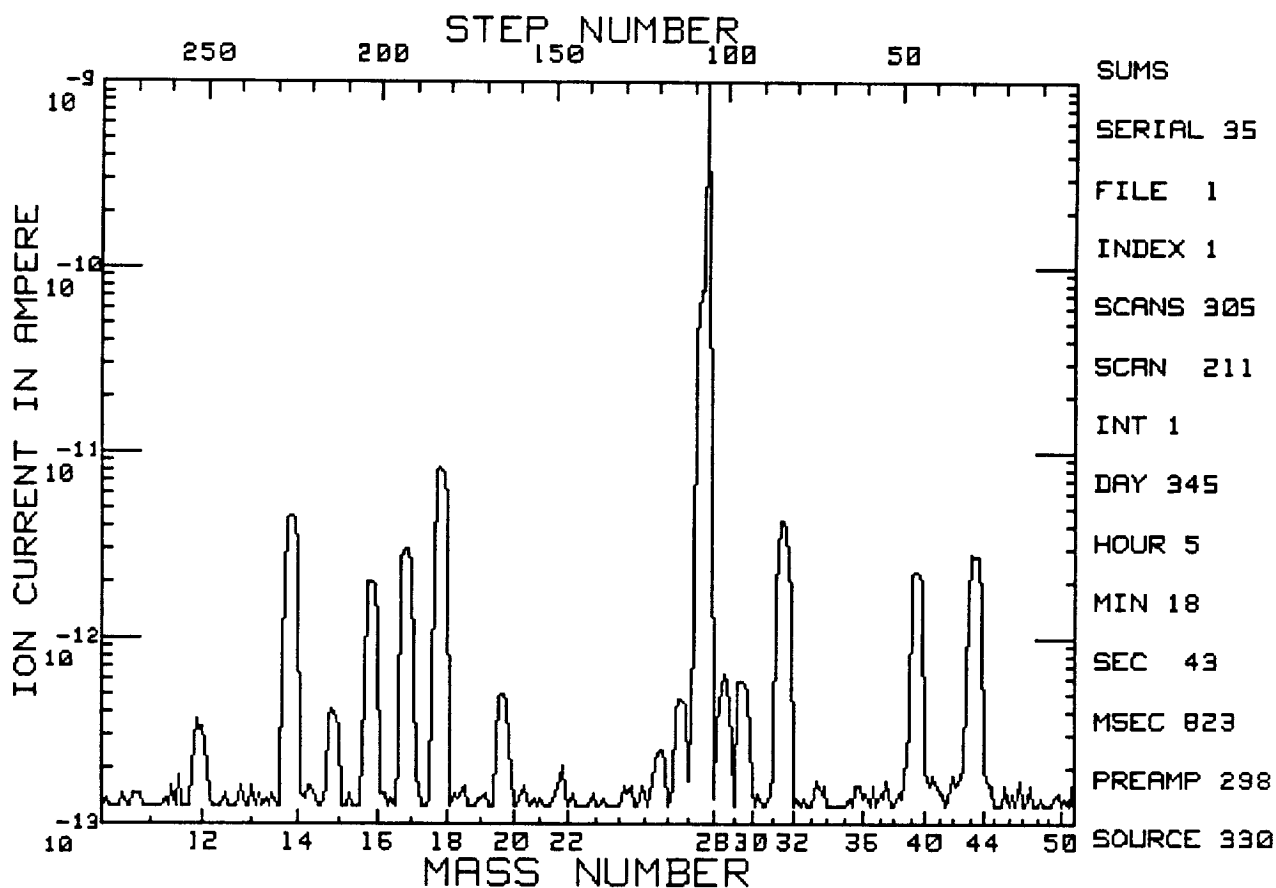
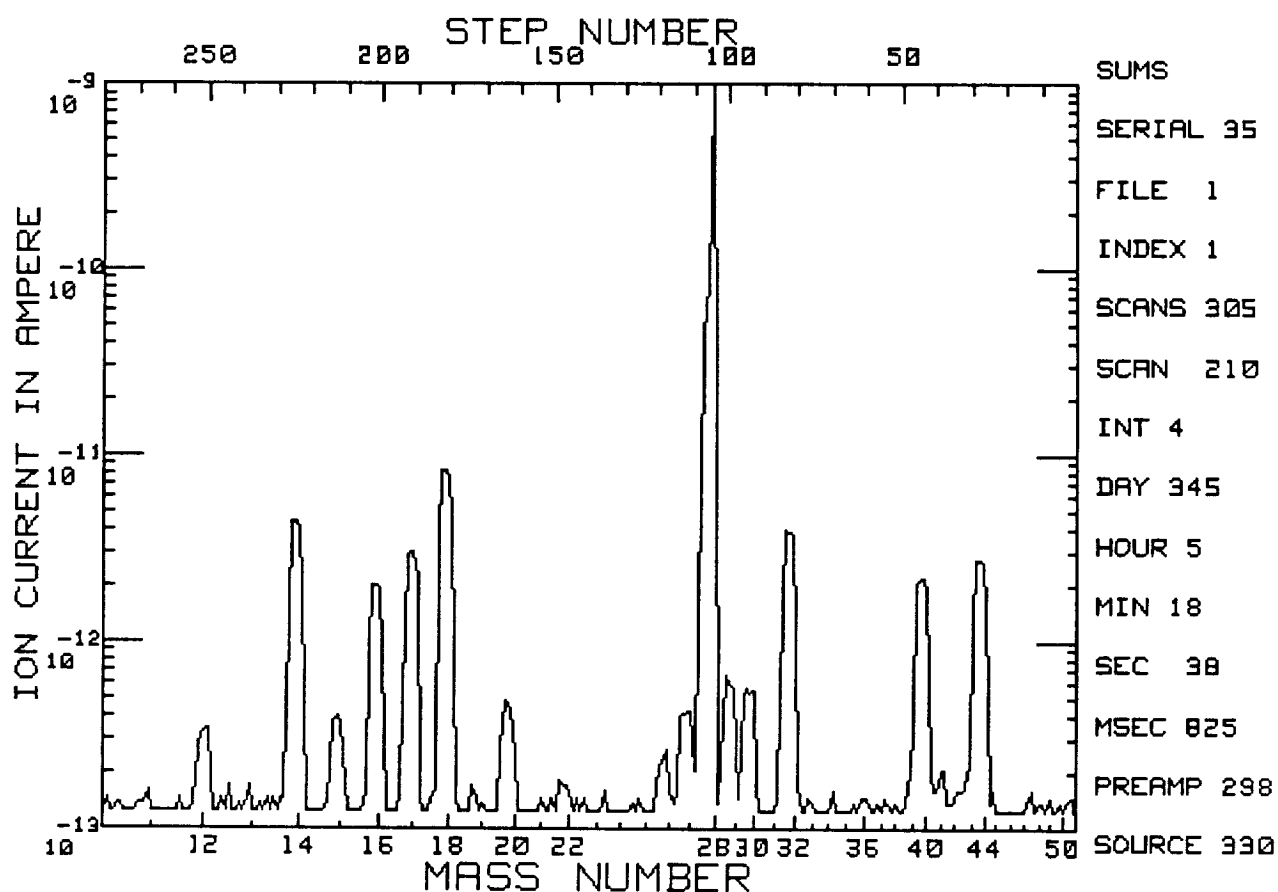
Unclas
63/19 0109357

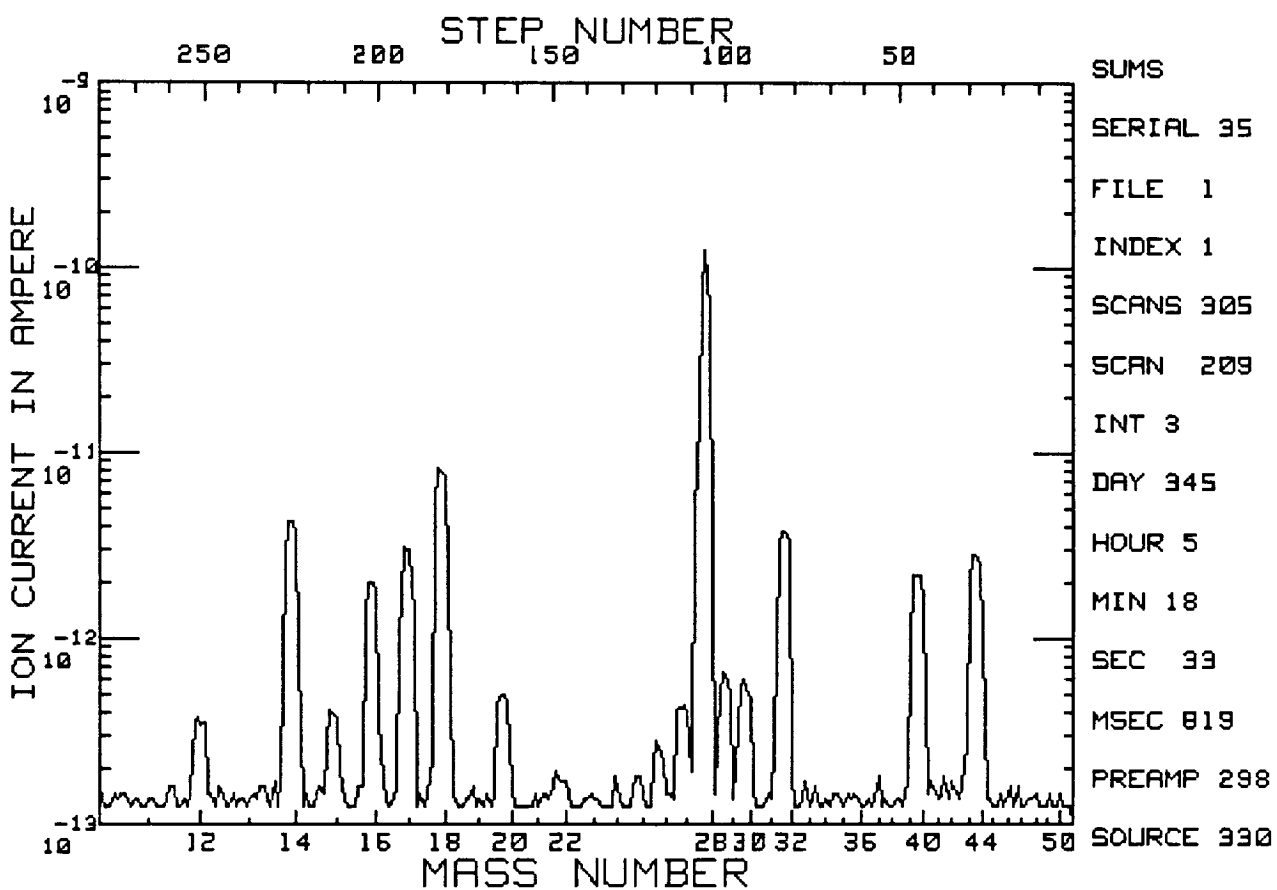
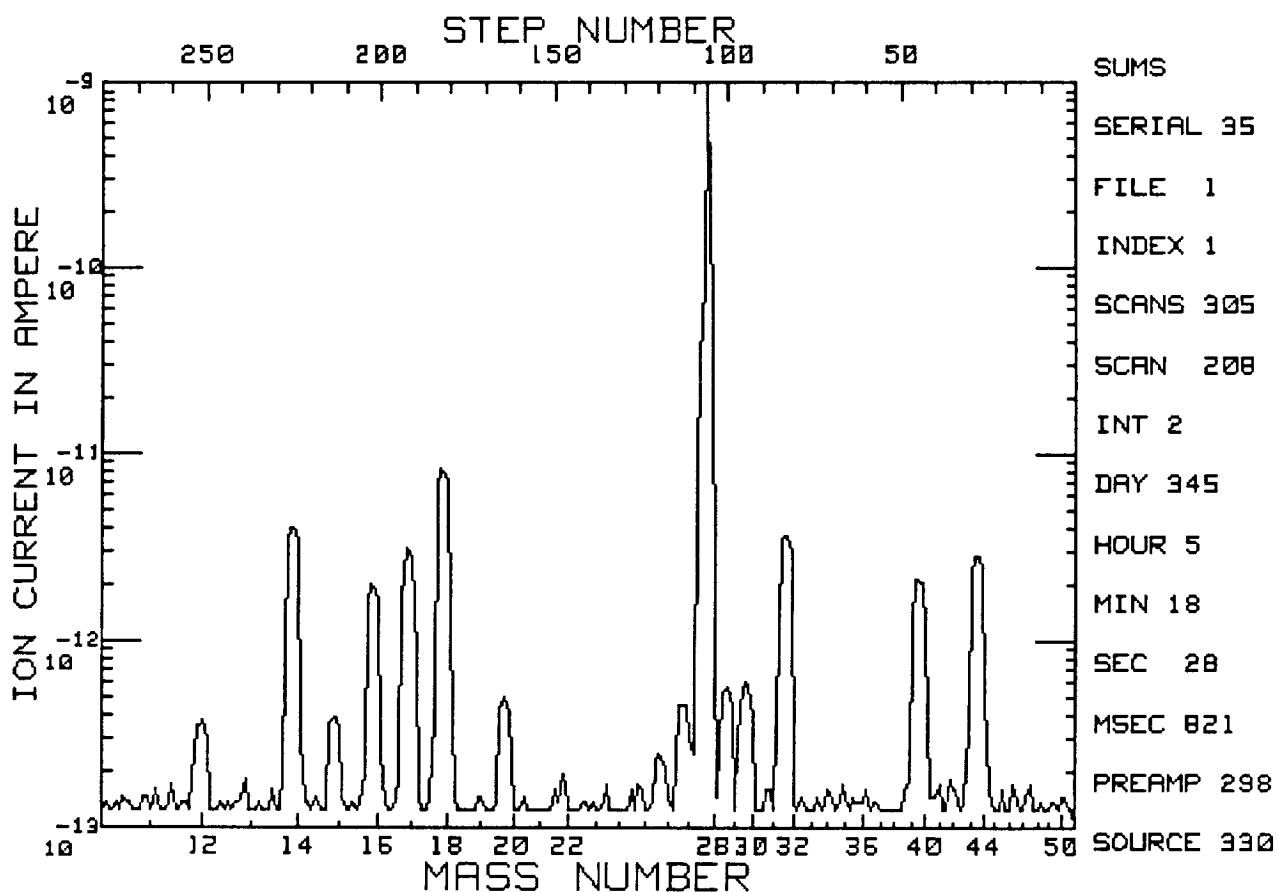


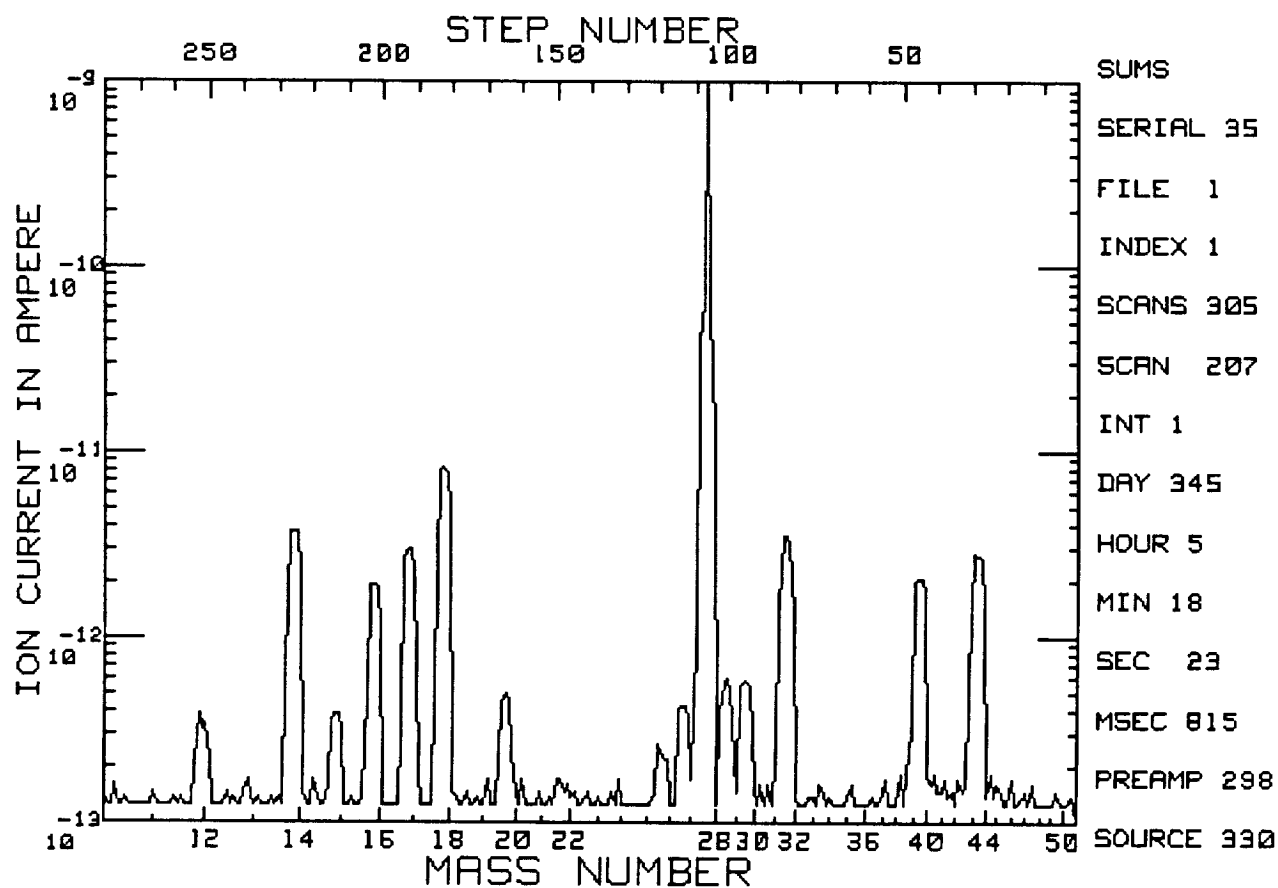
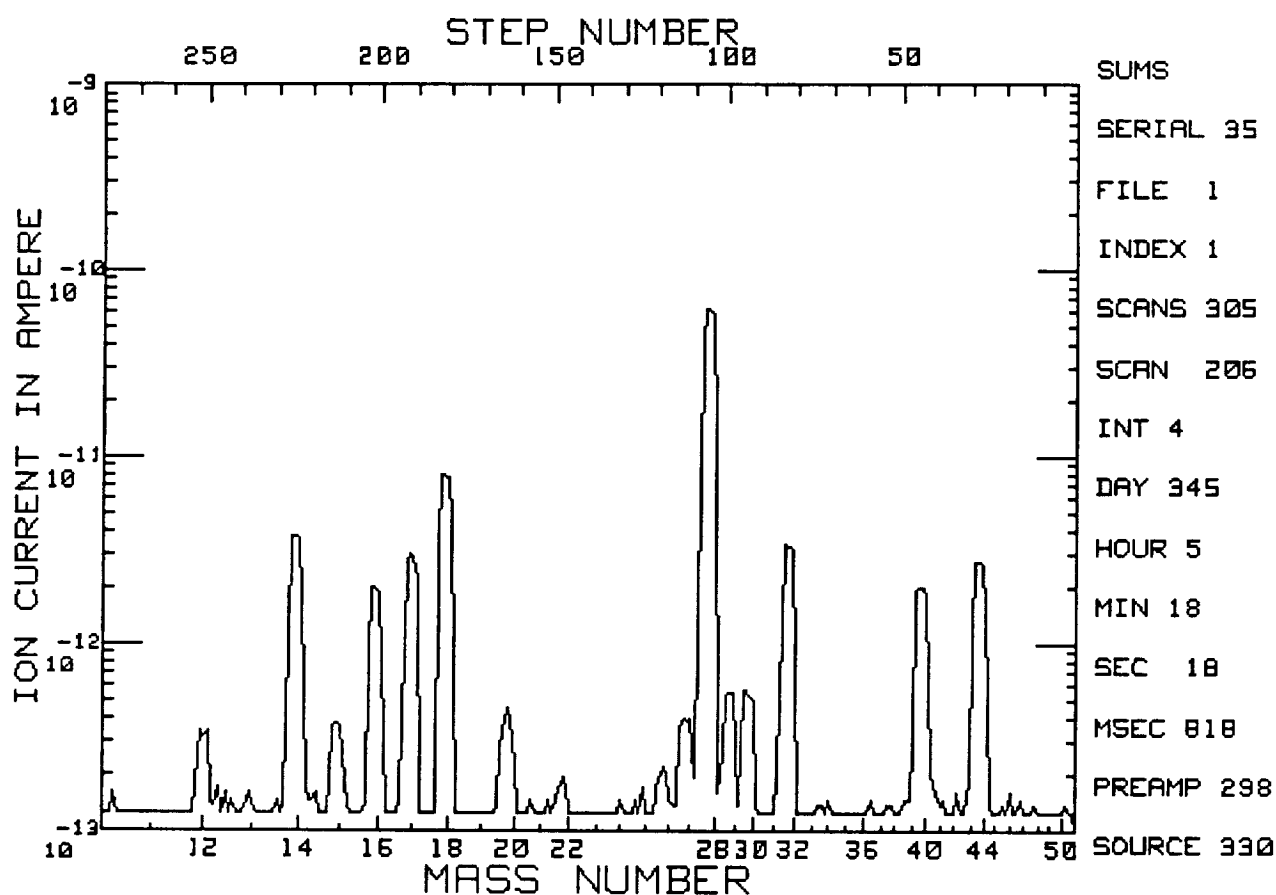


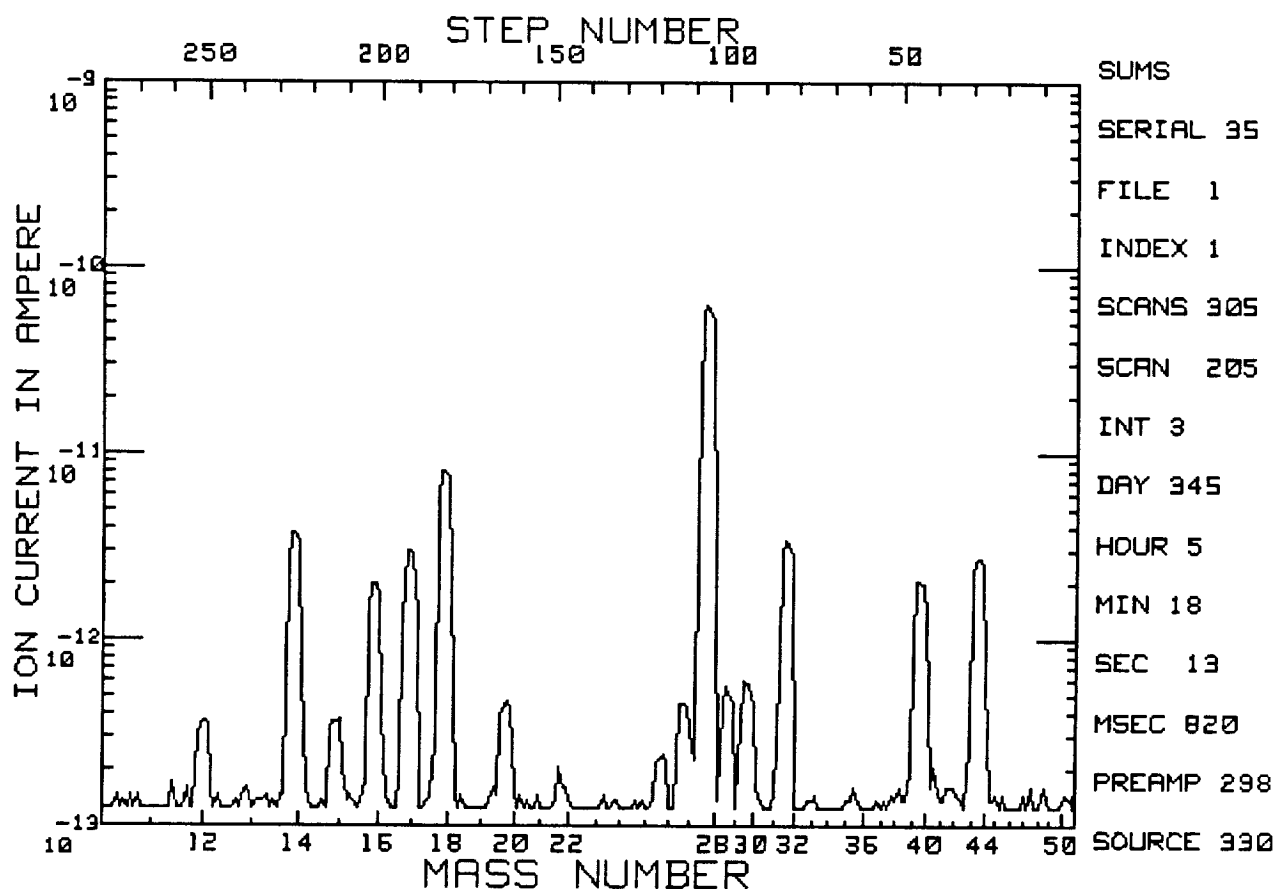
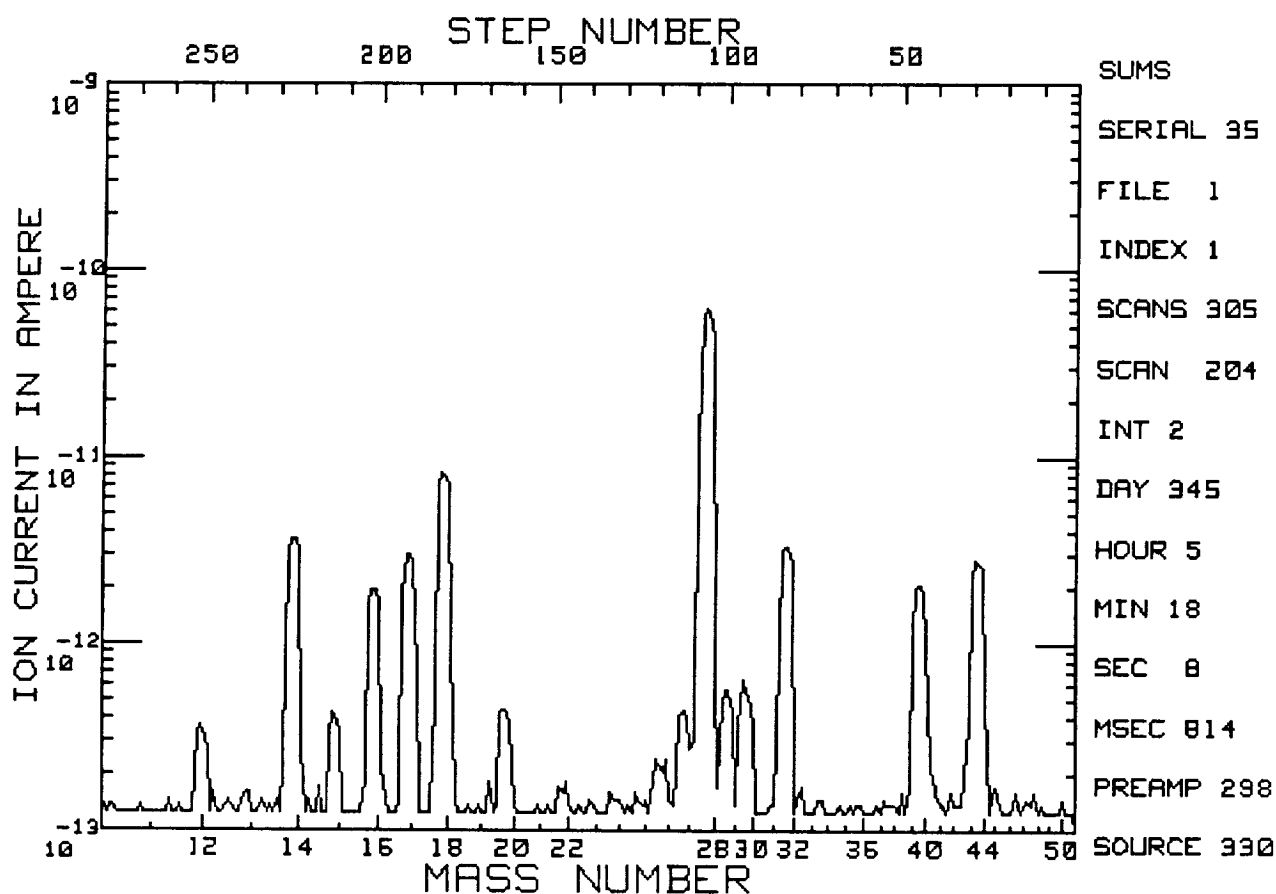


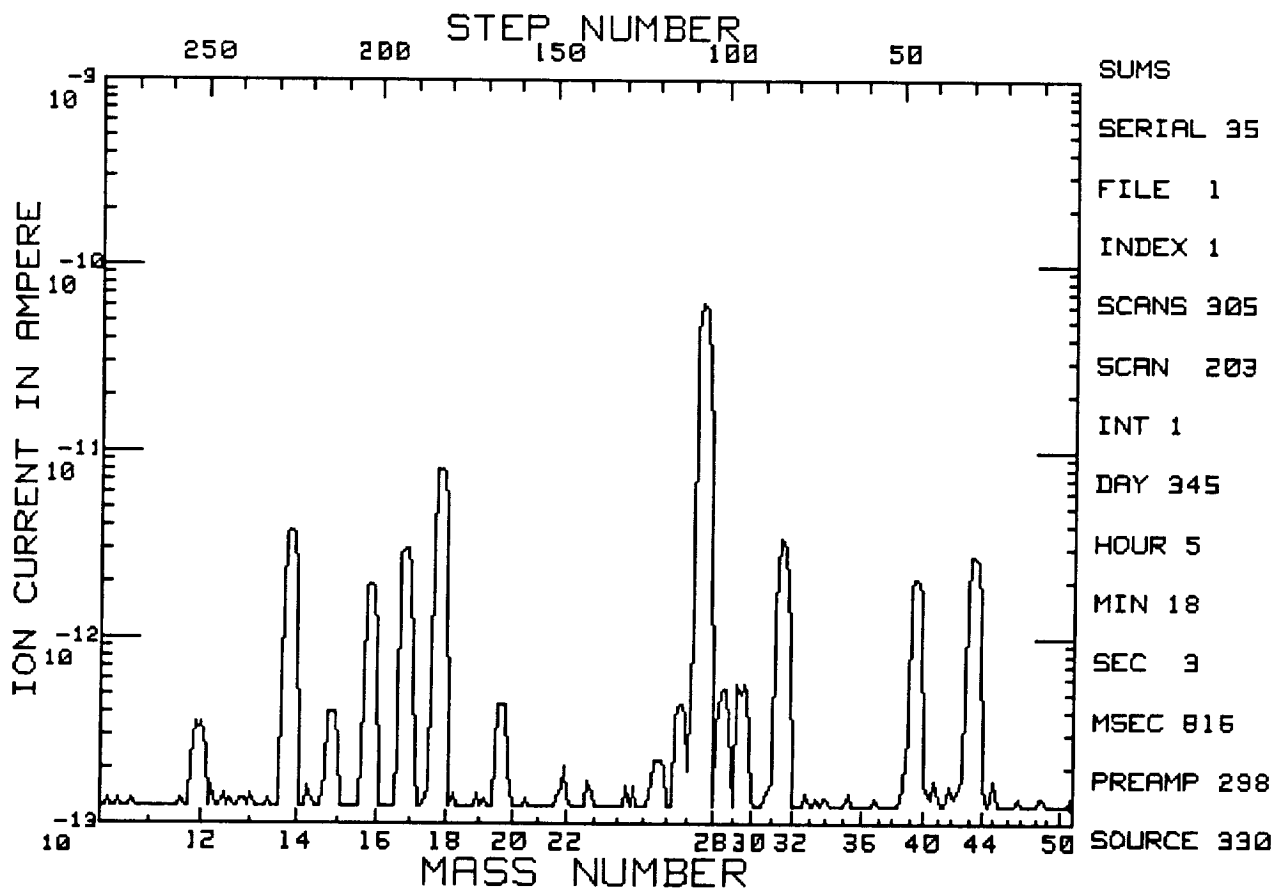
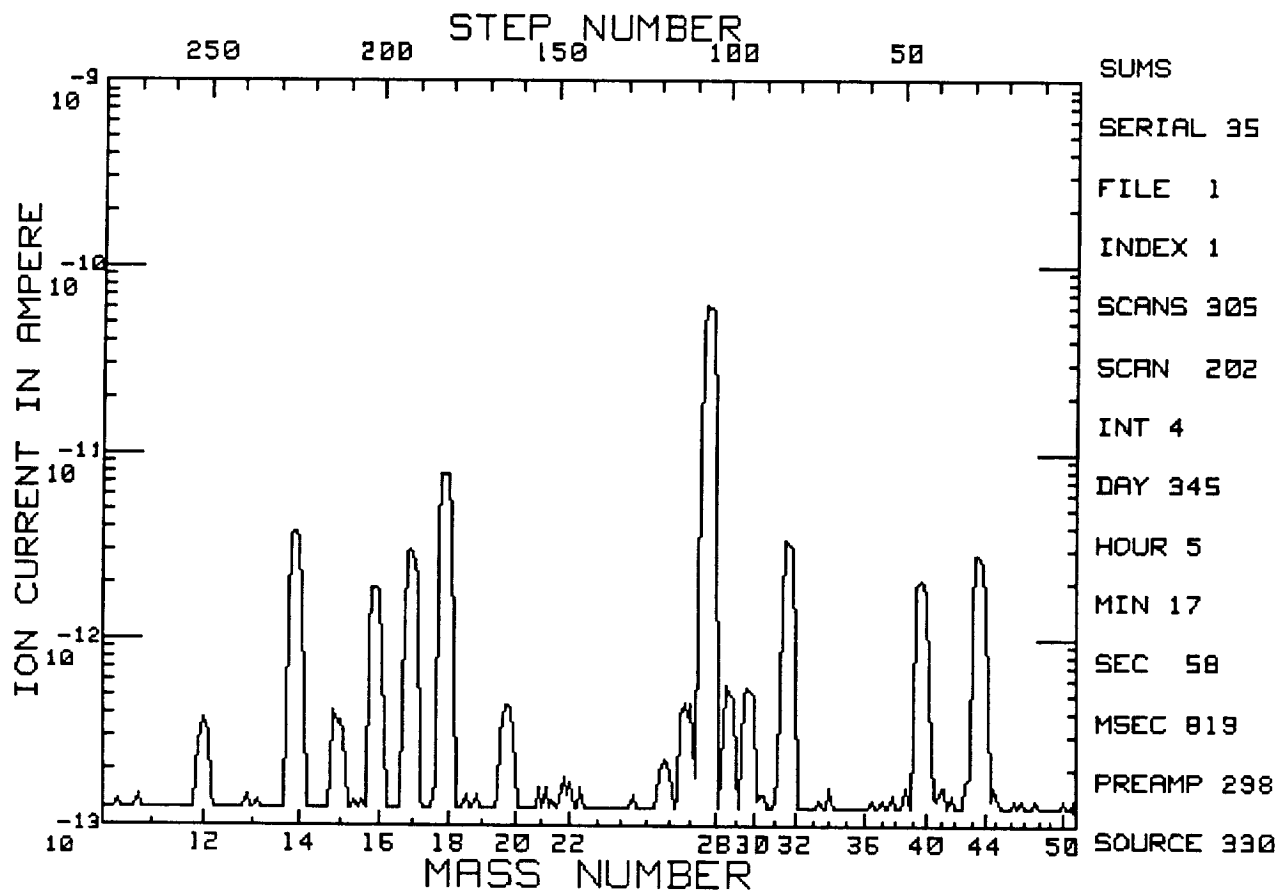


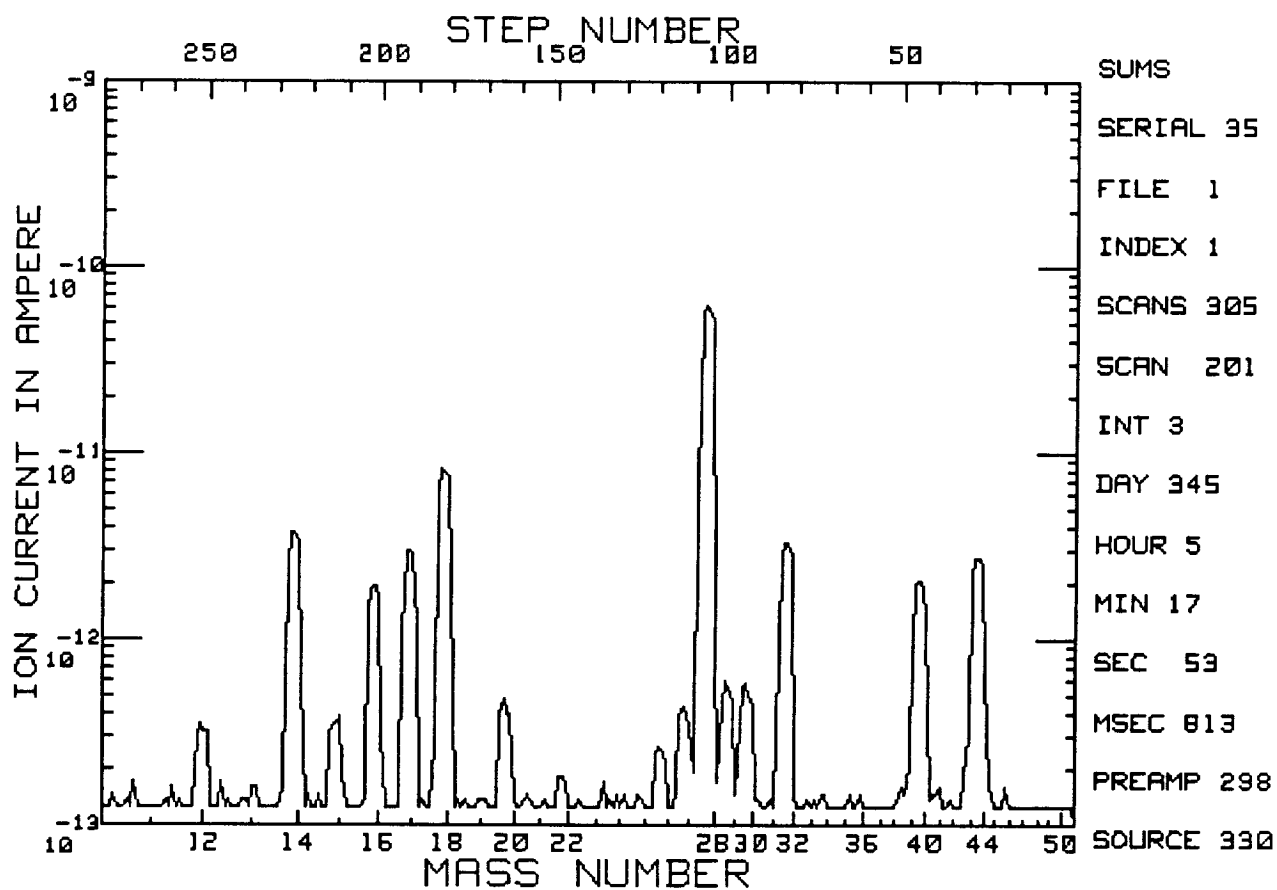
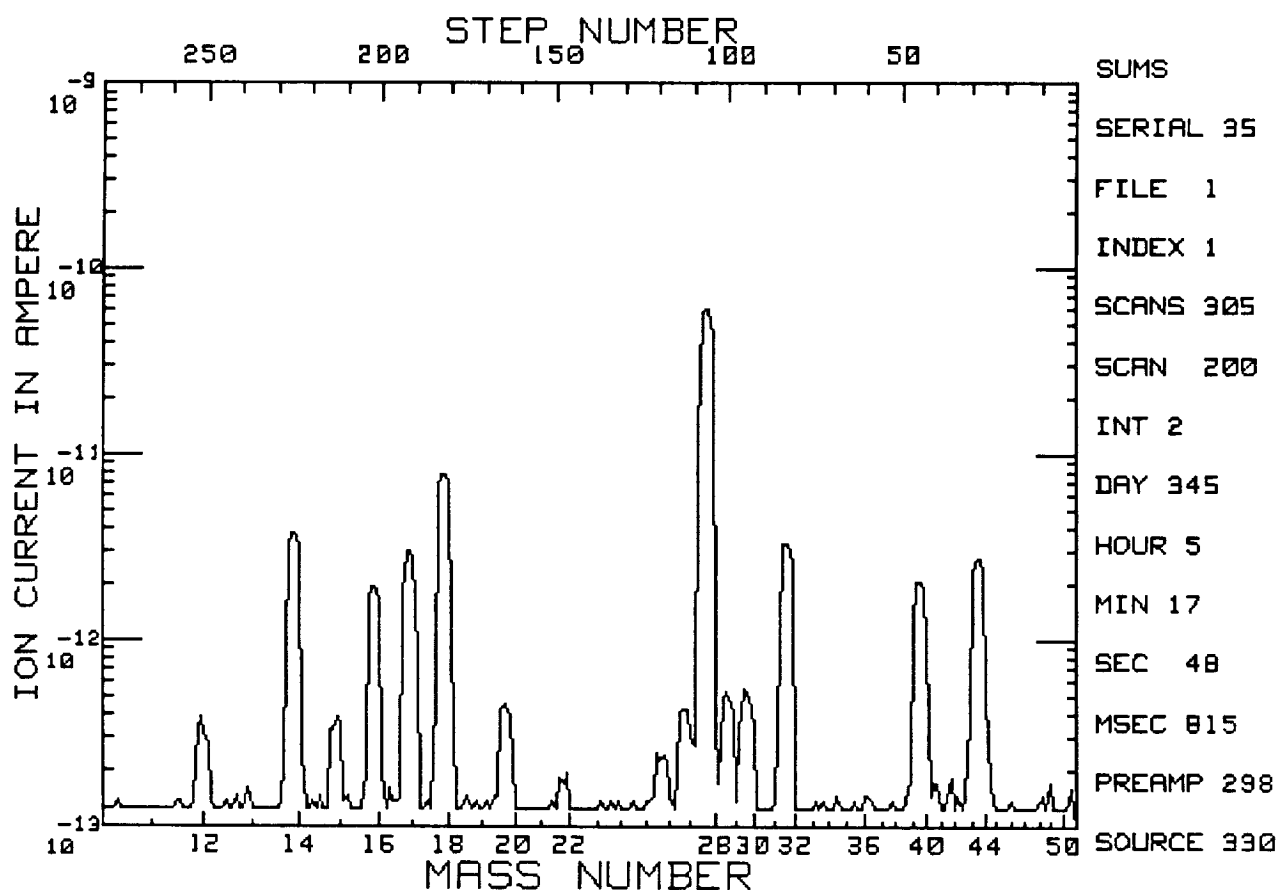


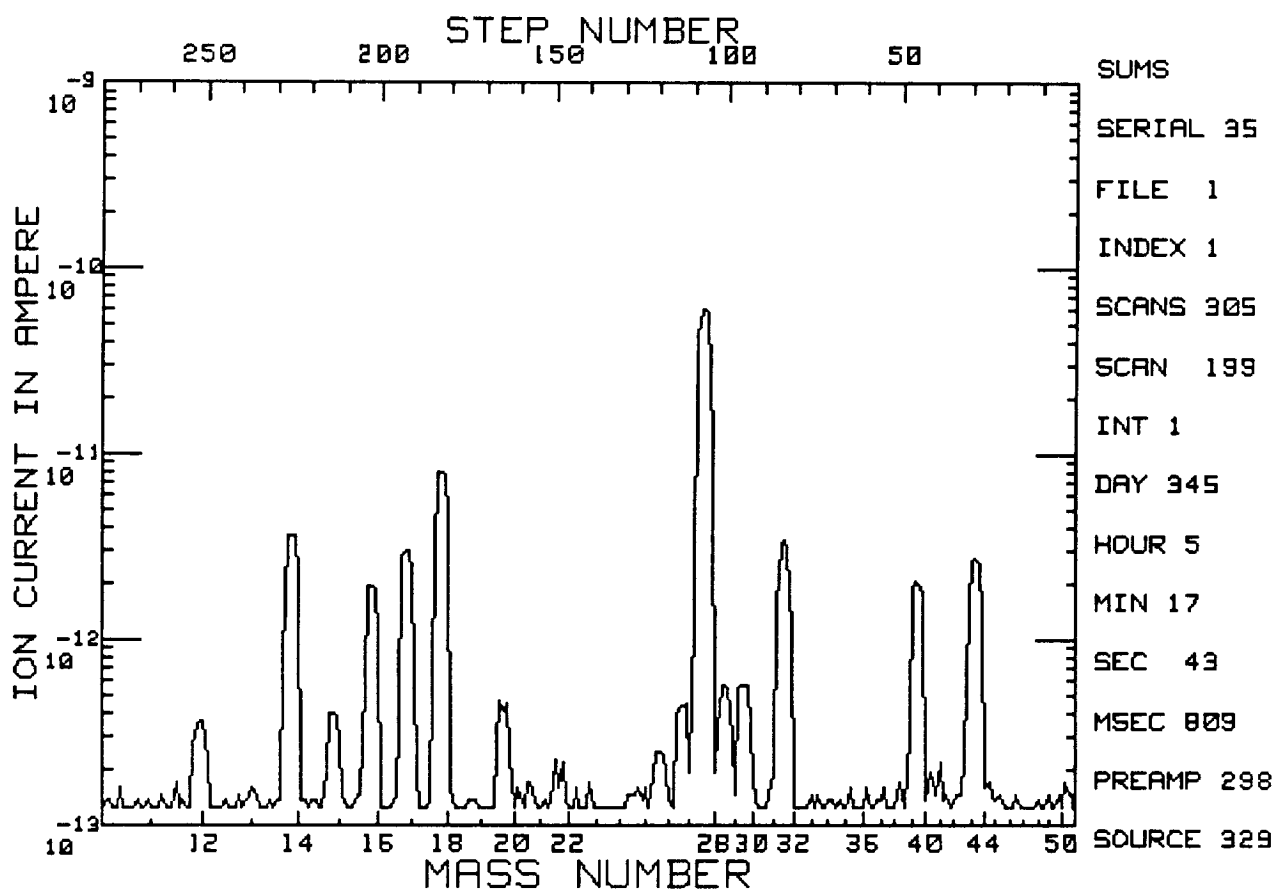
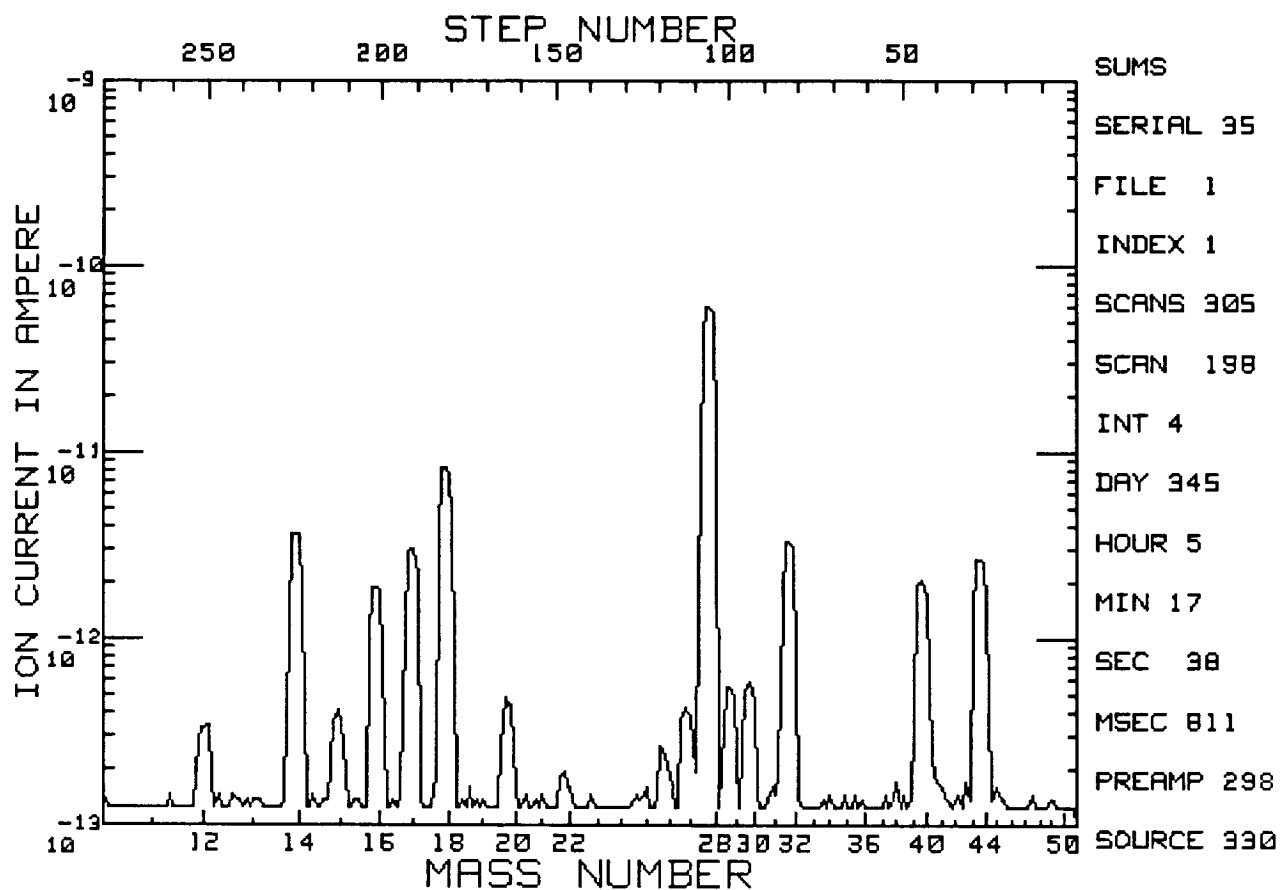


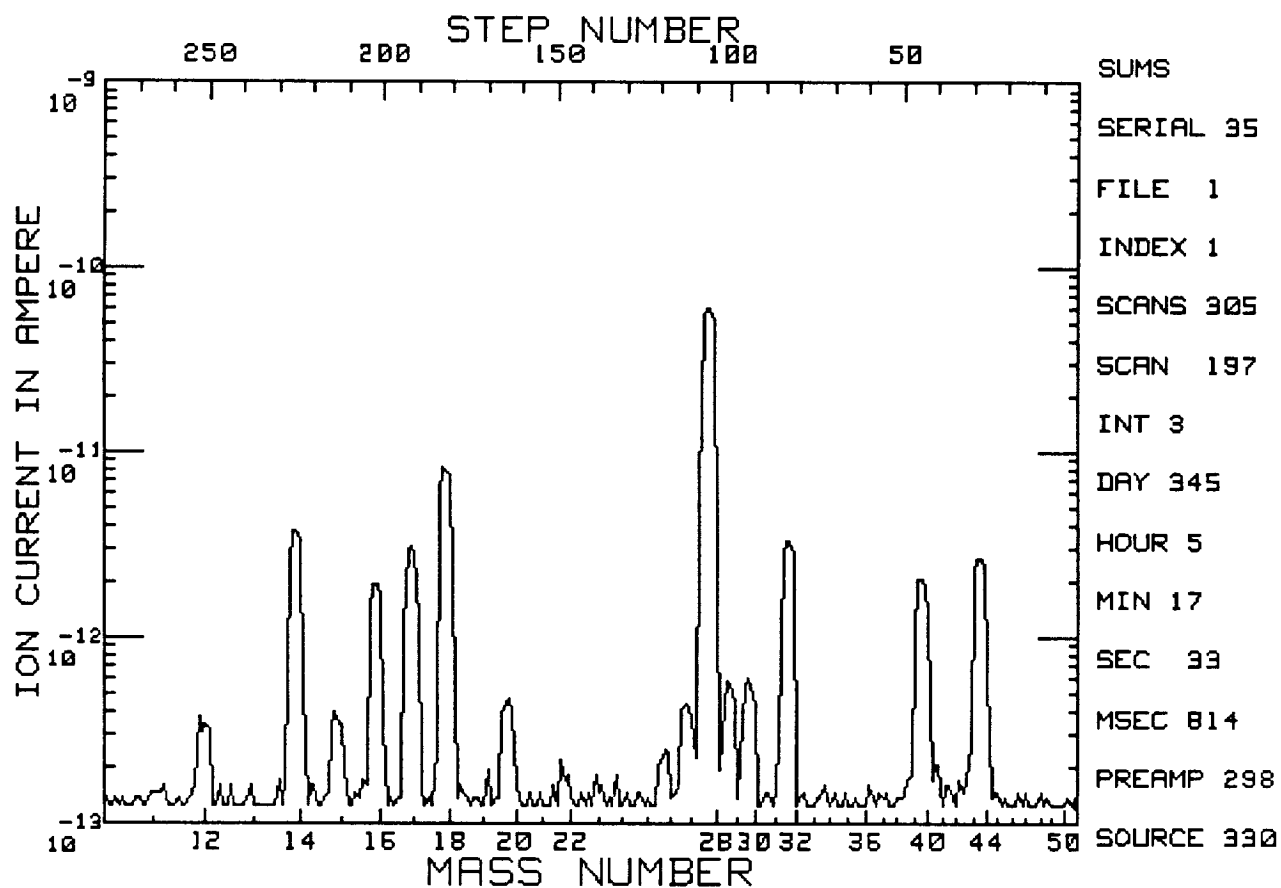
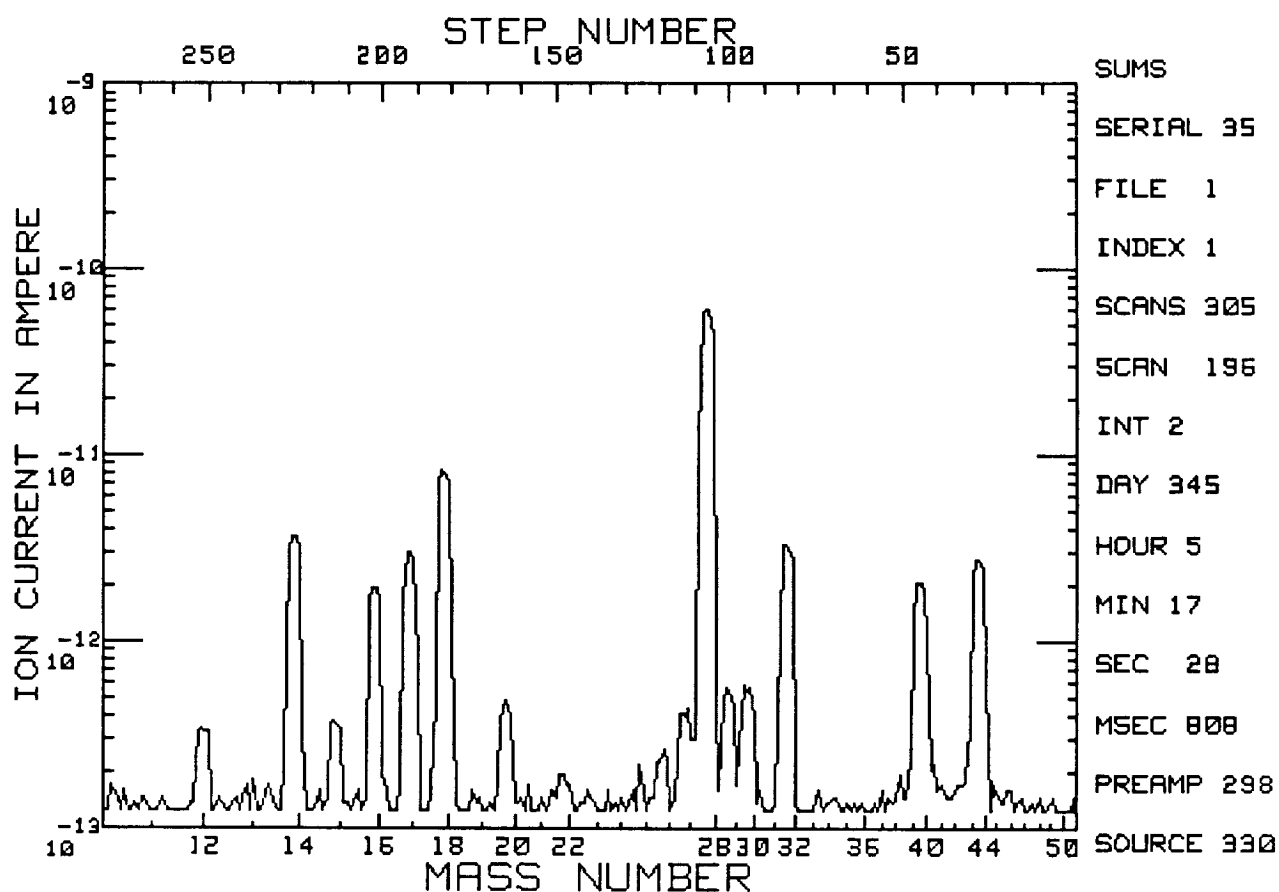


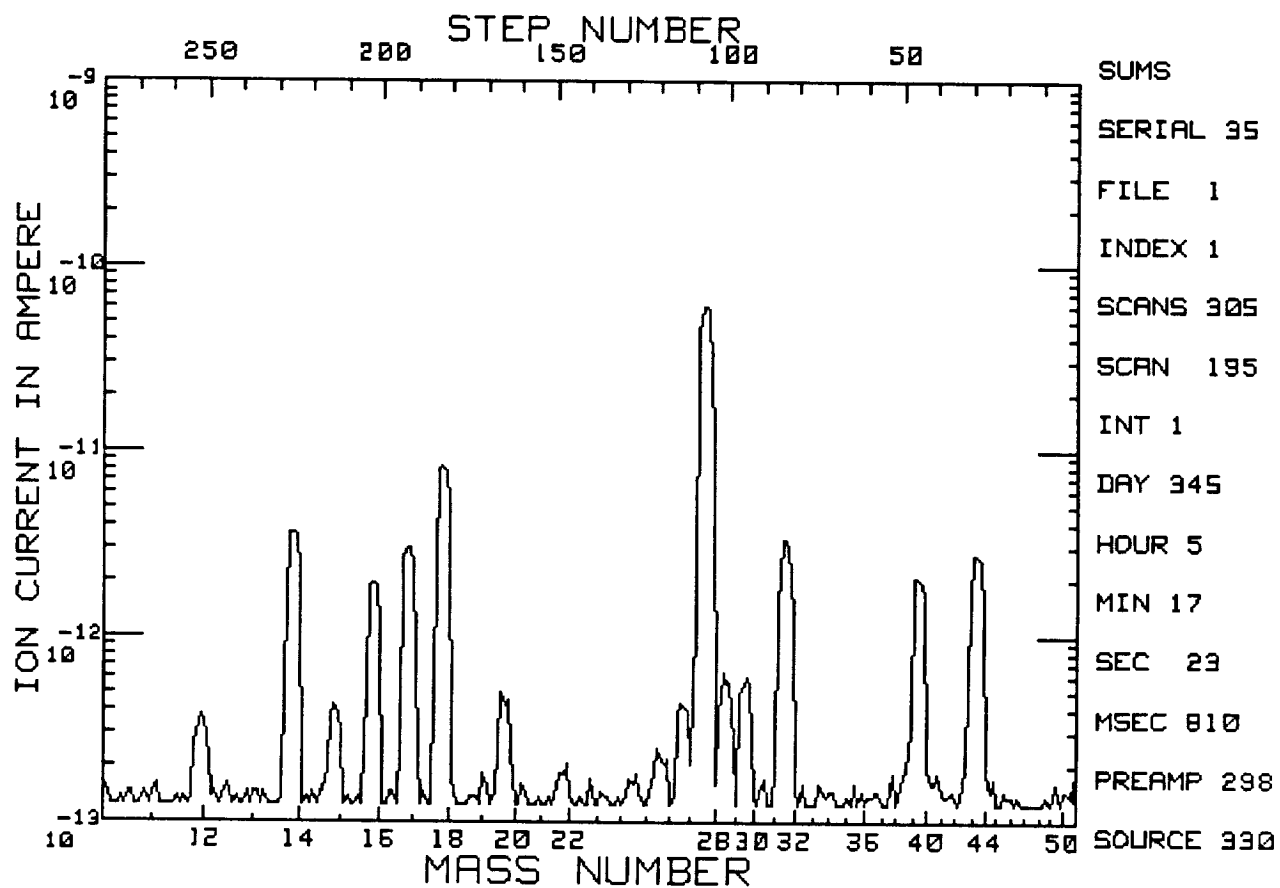
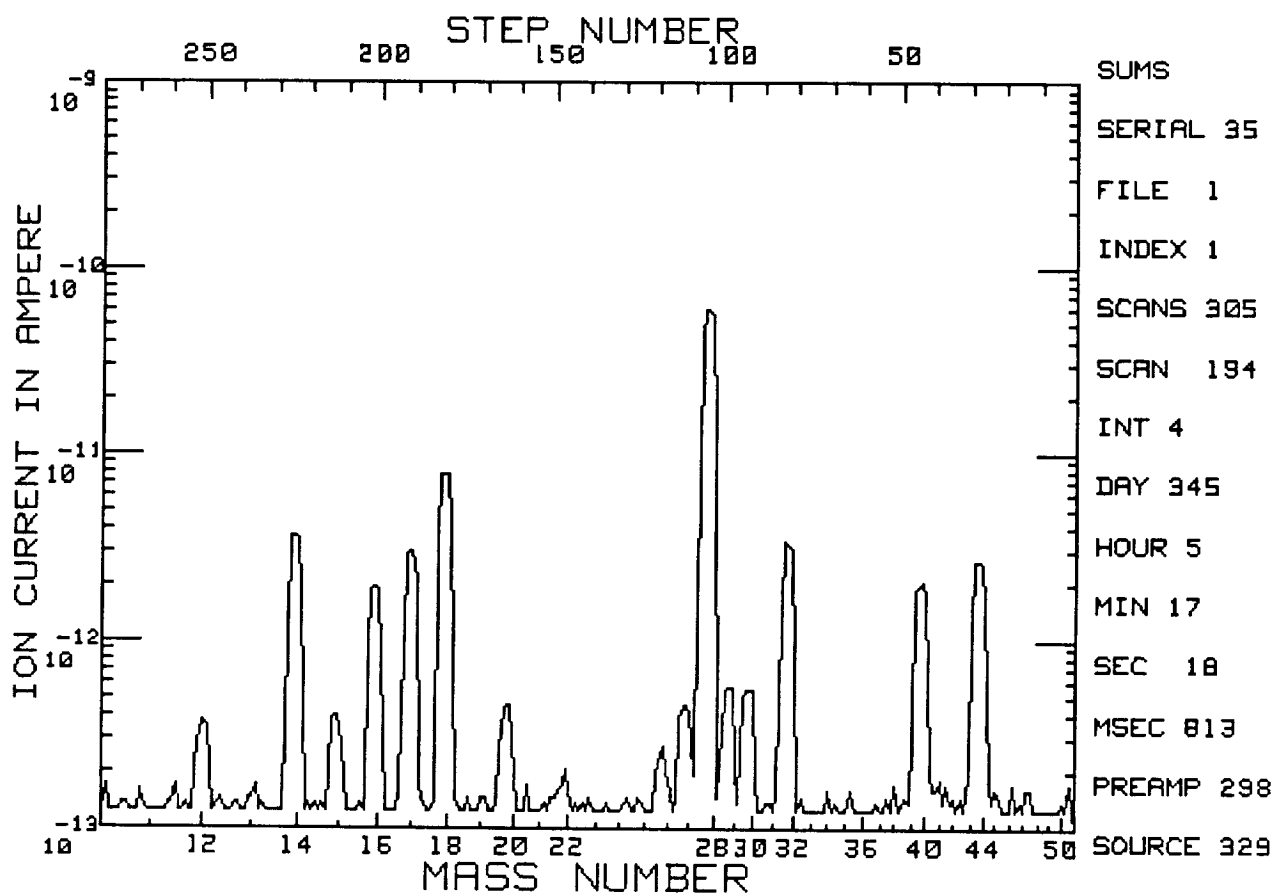


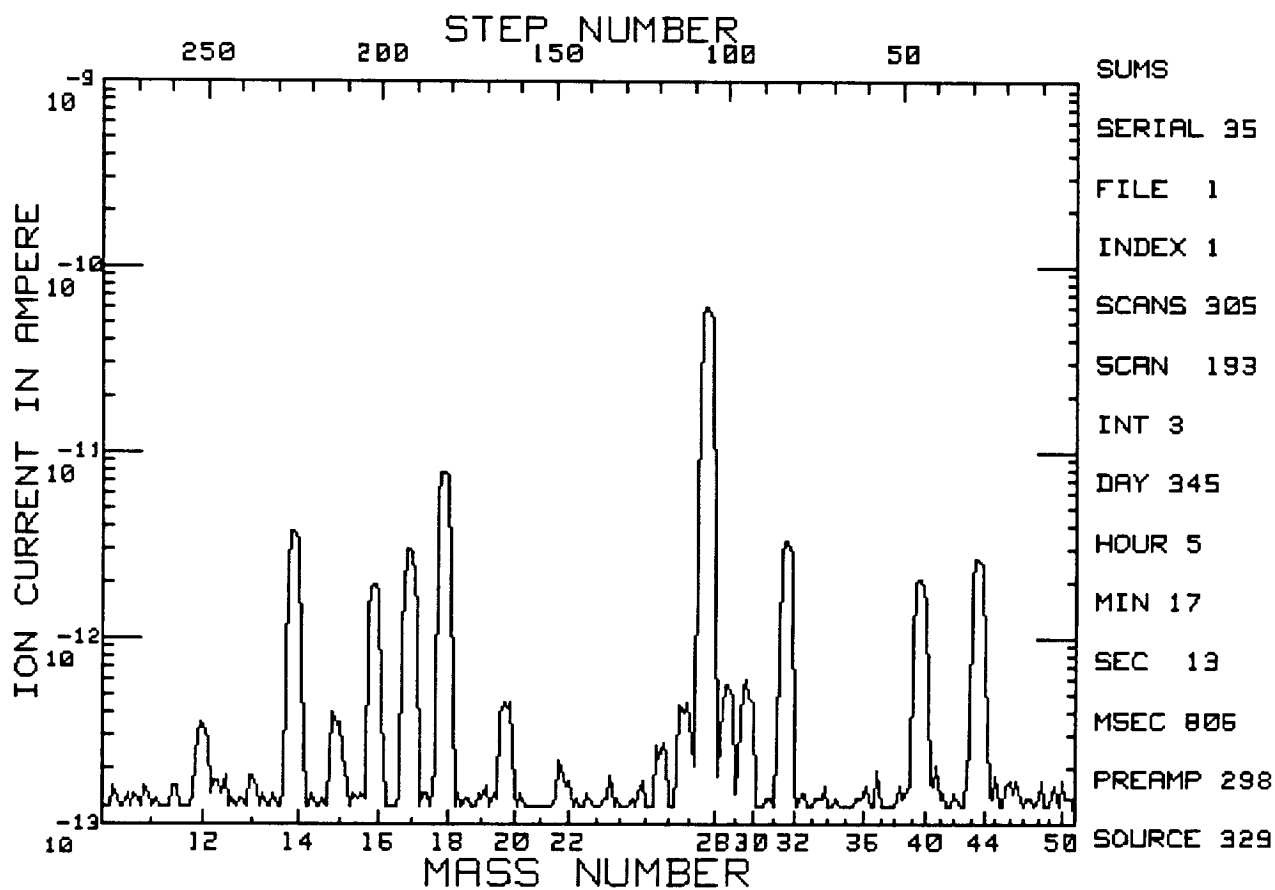
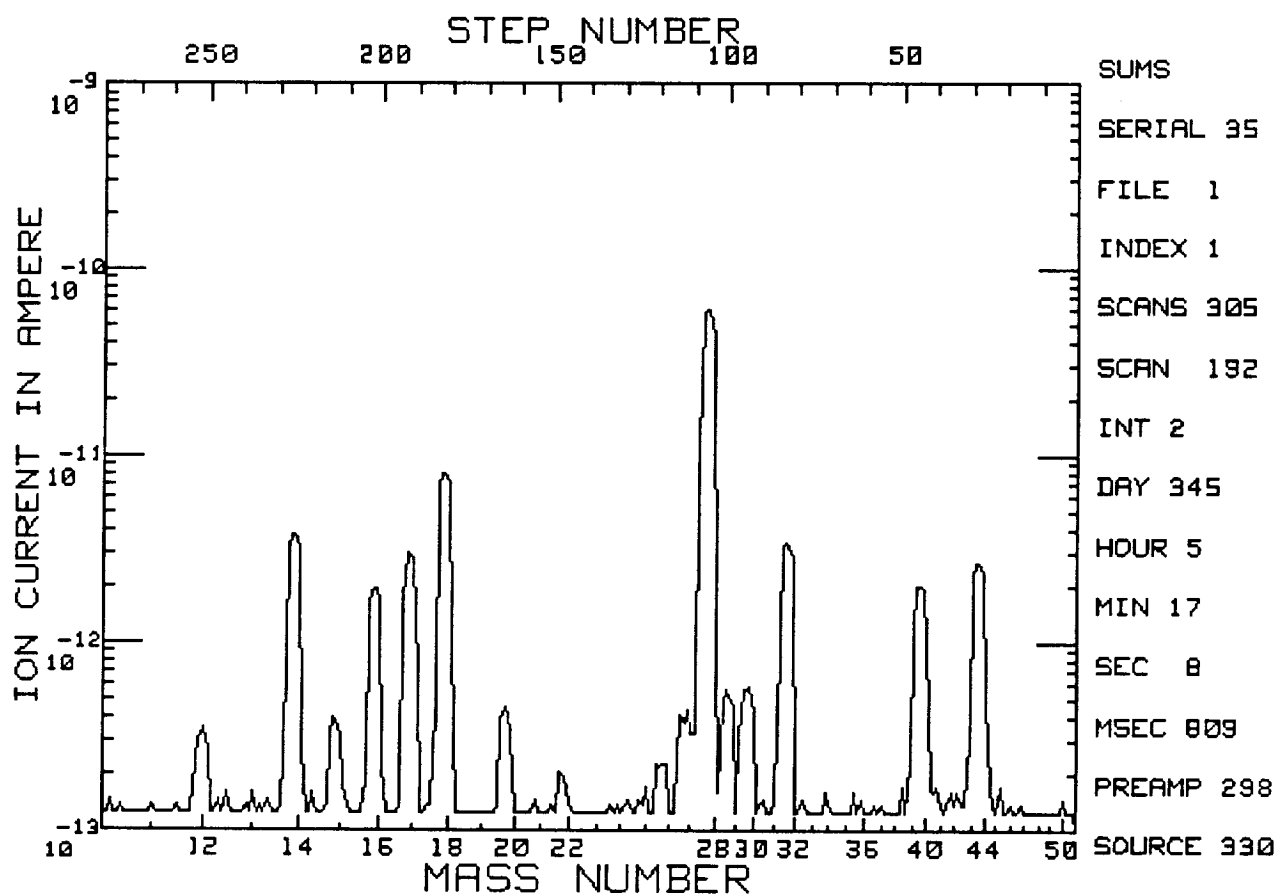


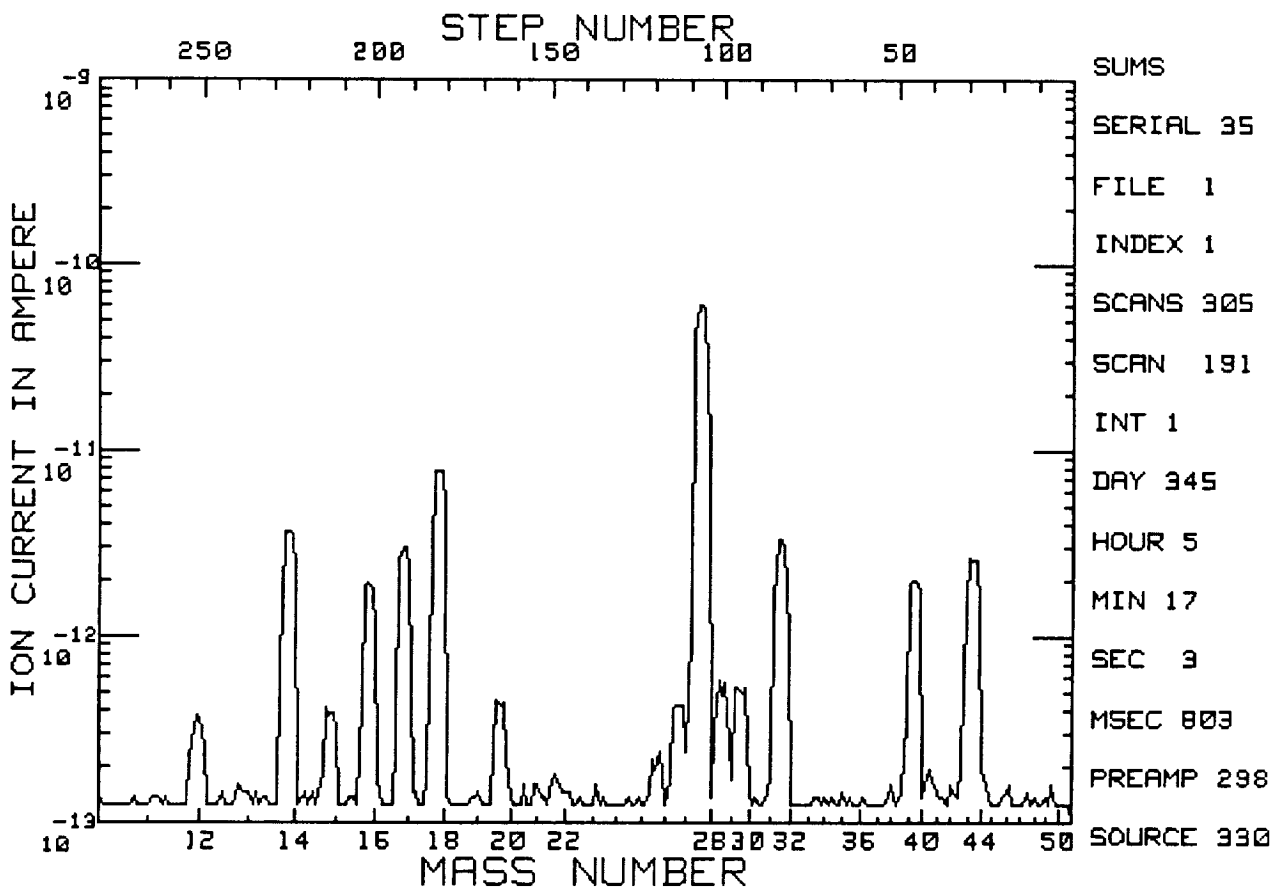
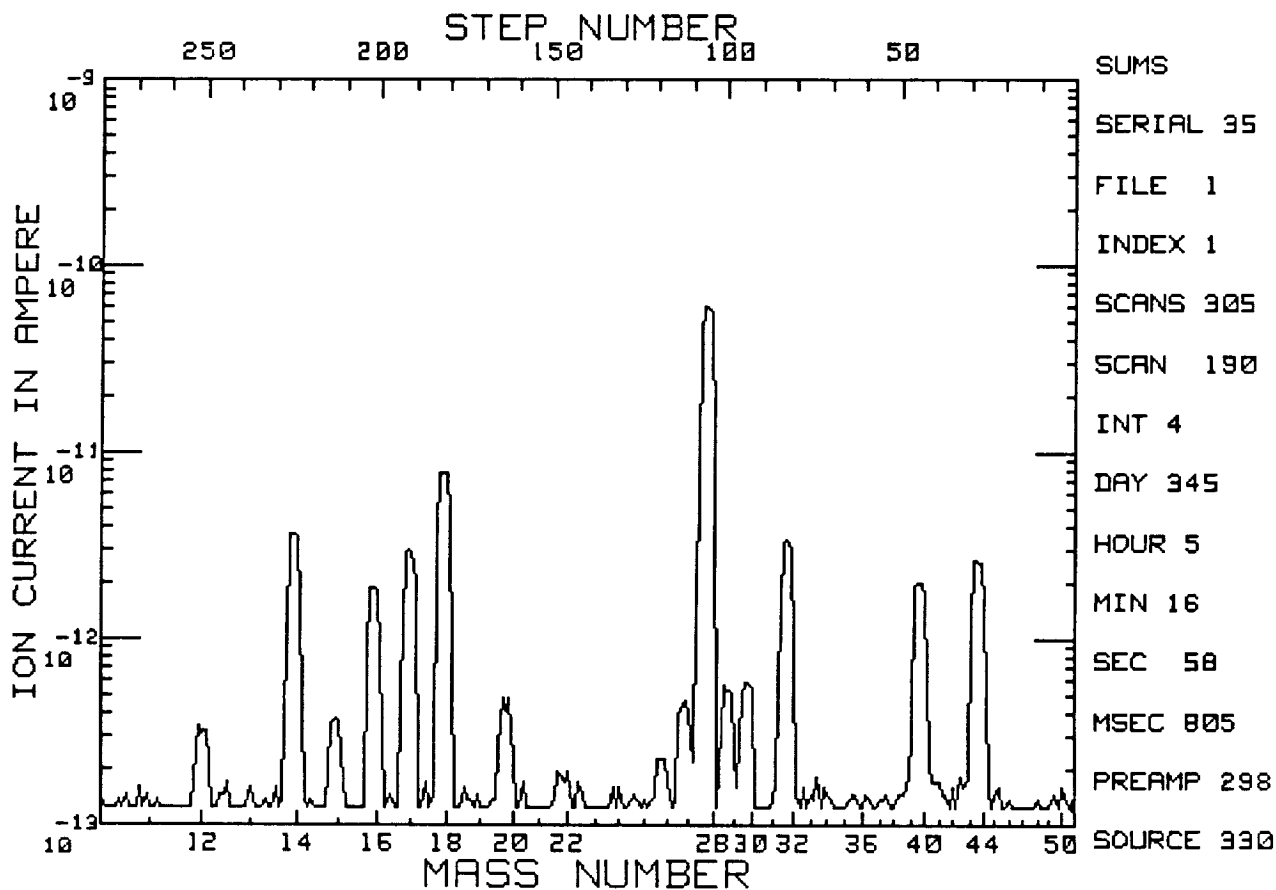


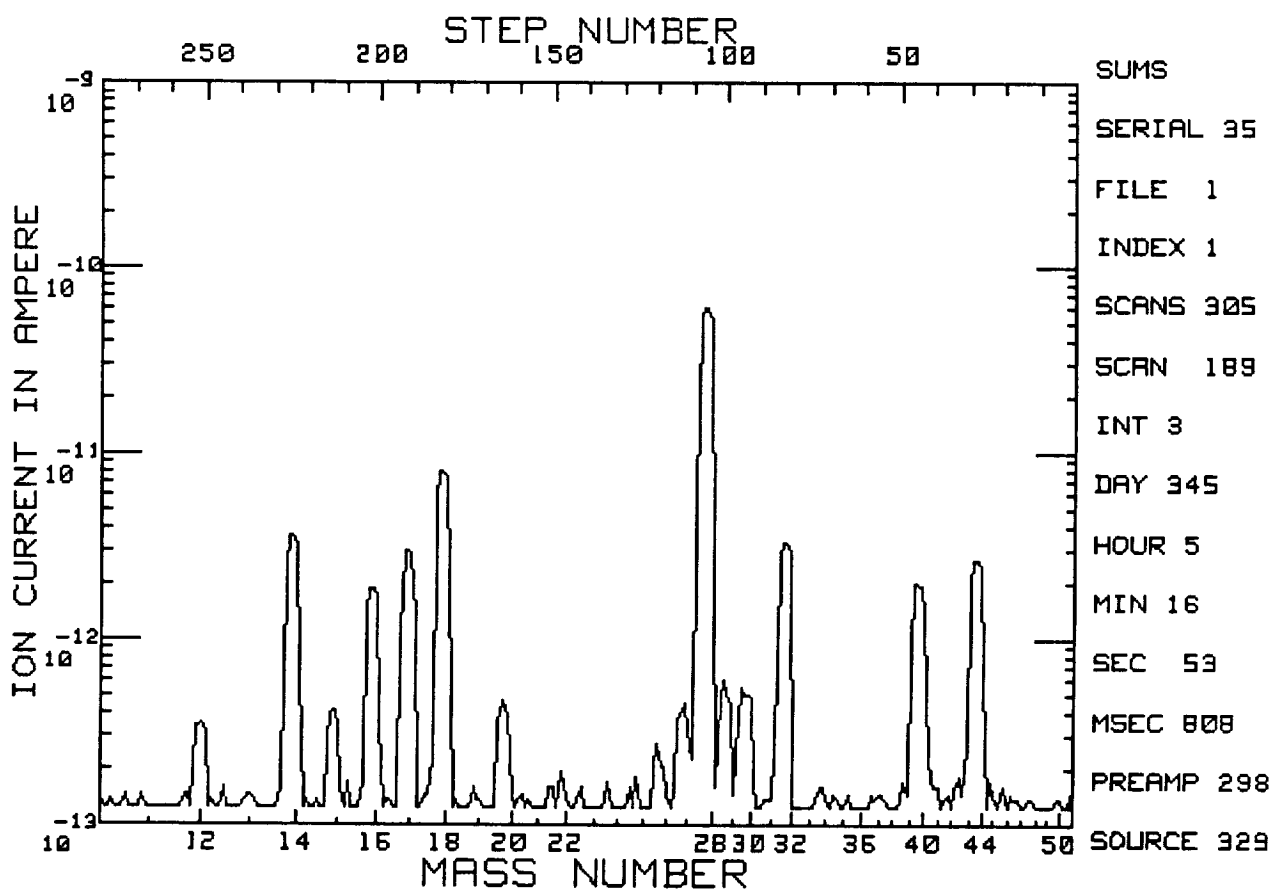
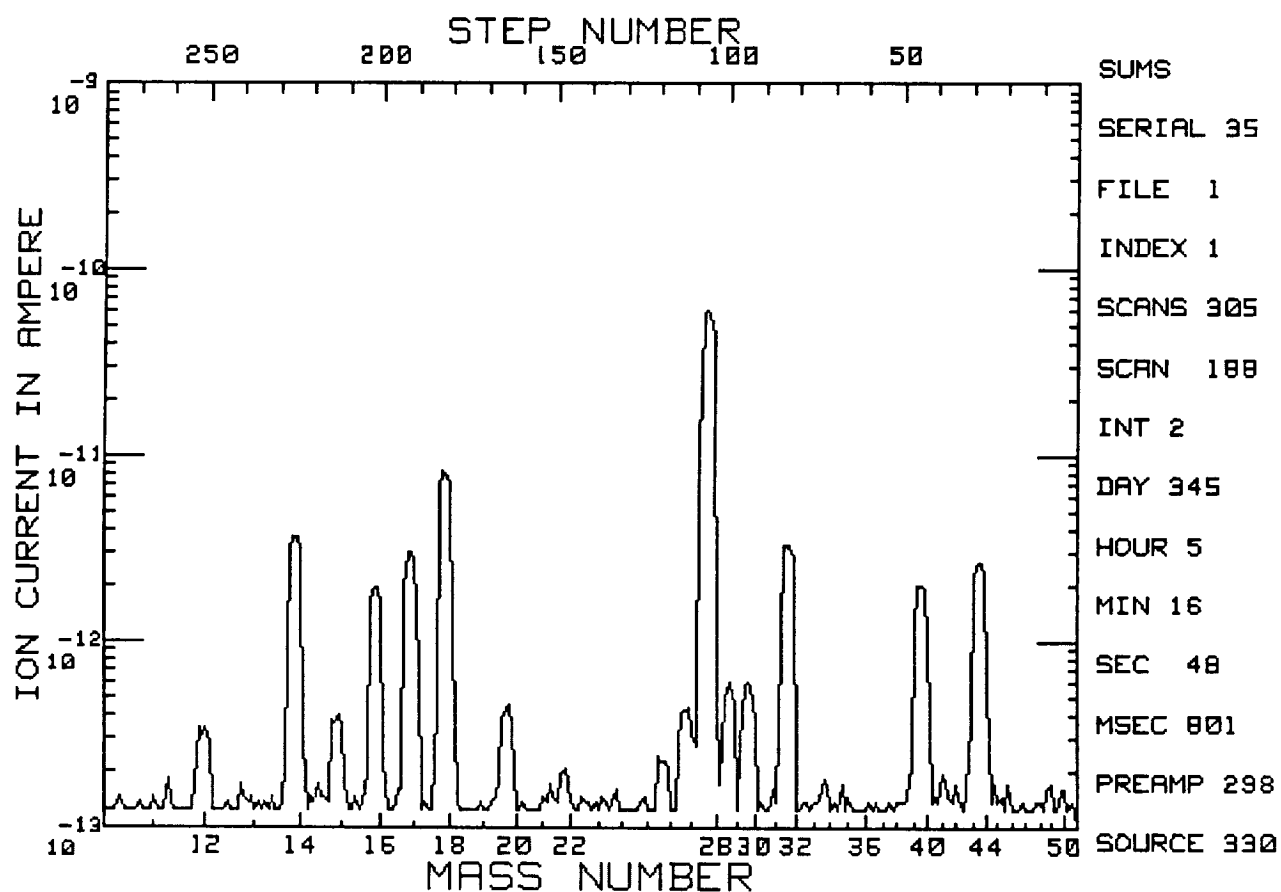


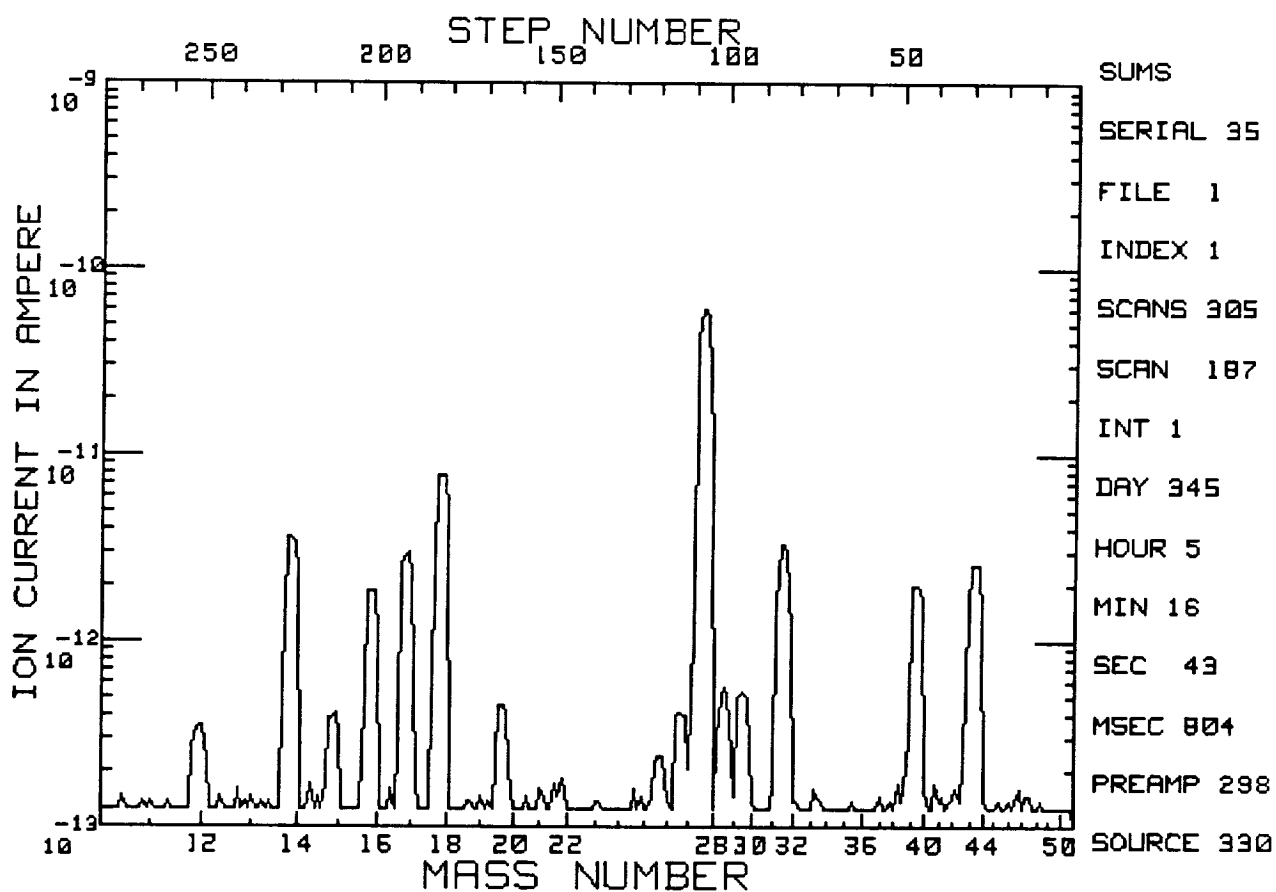
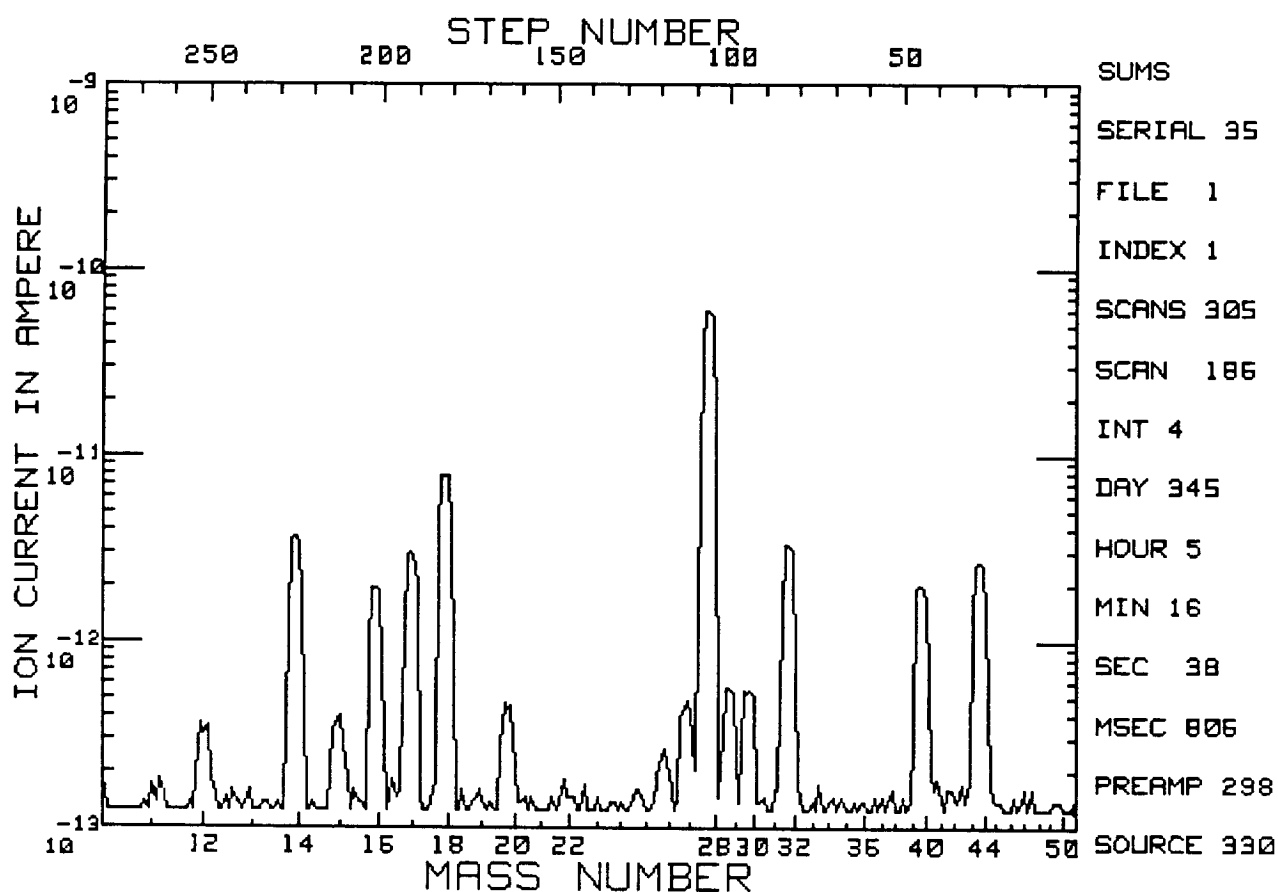


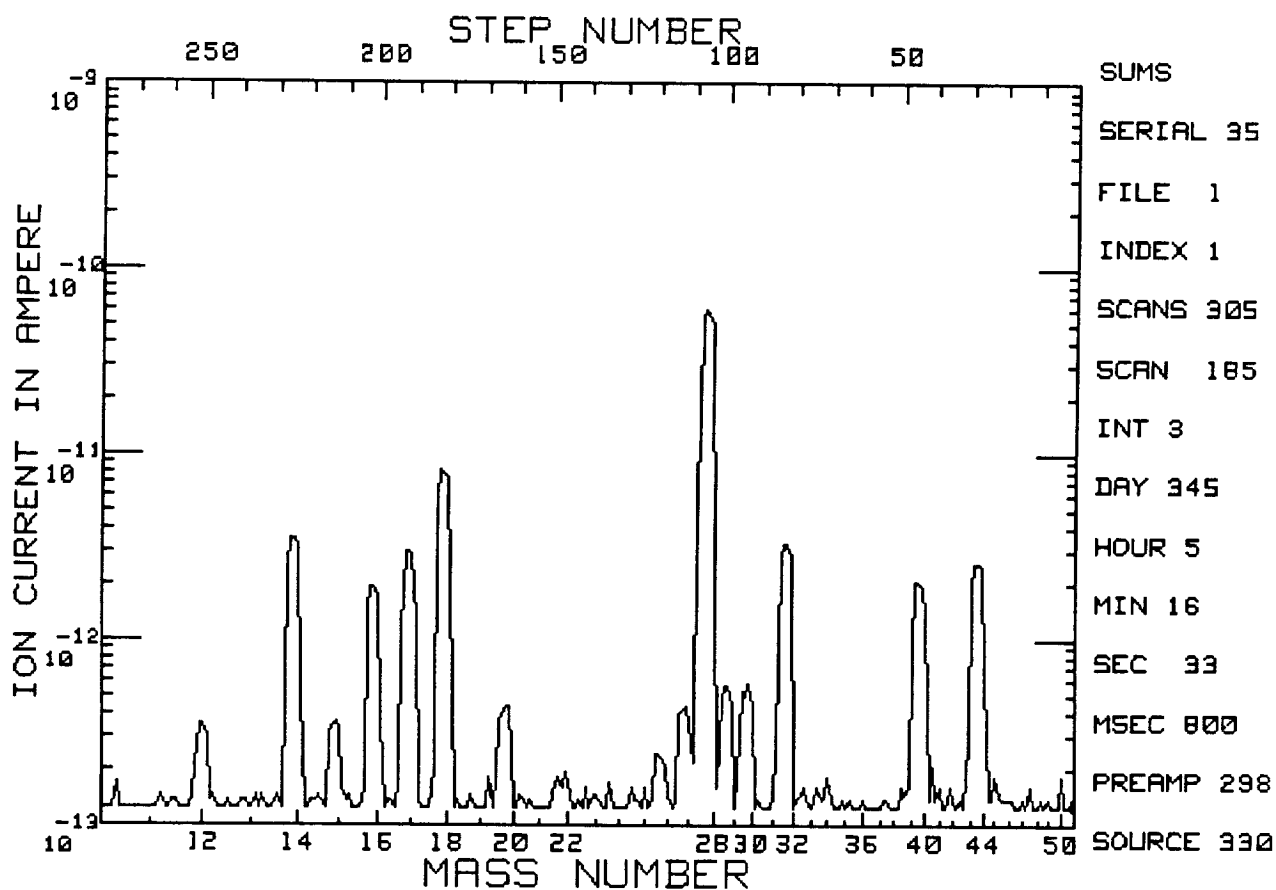
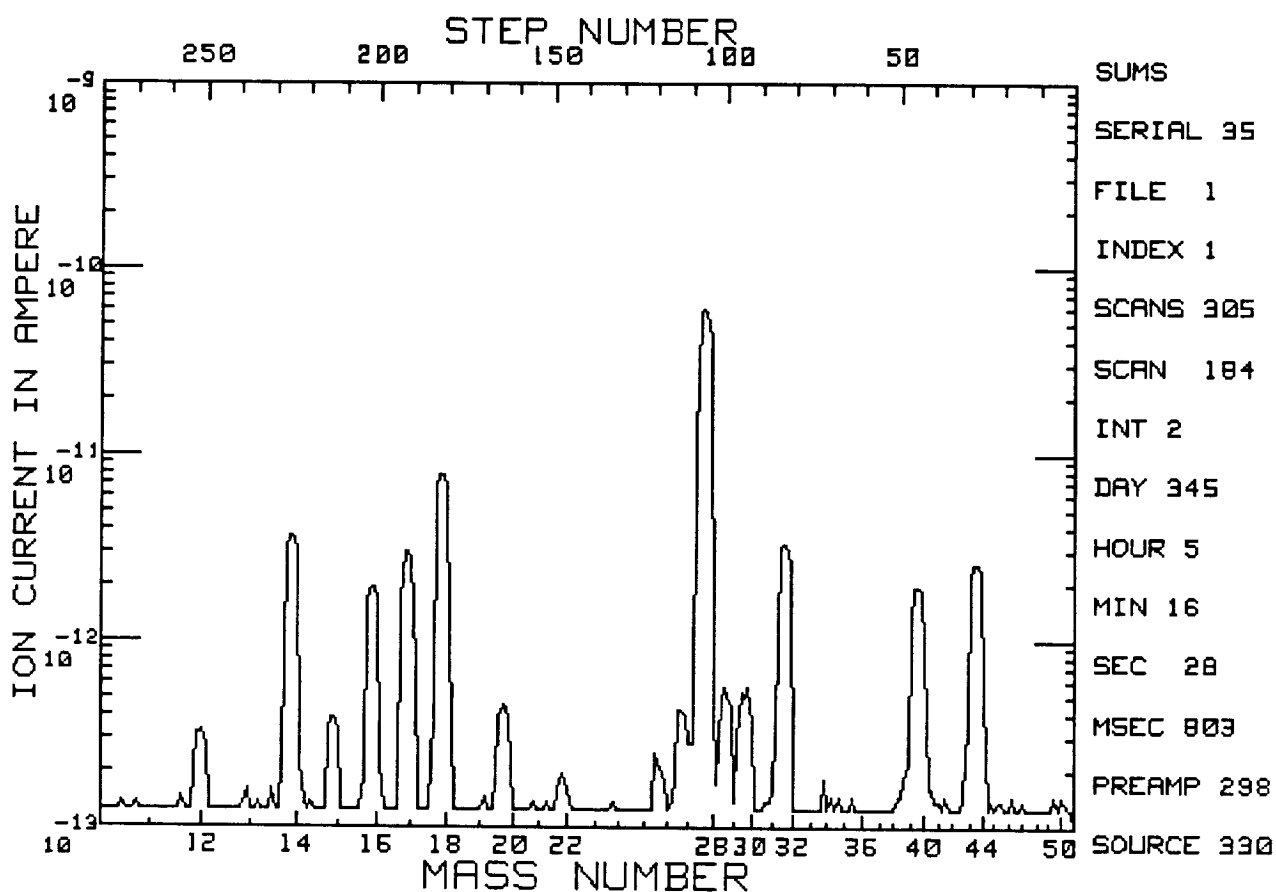


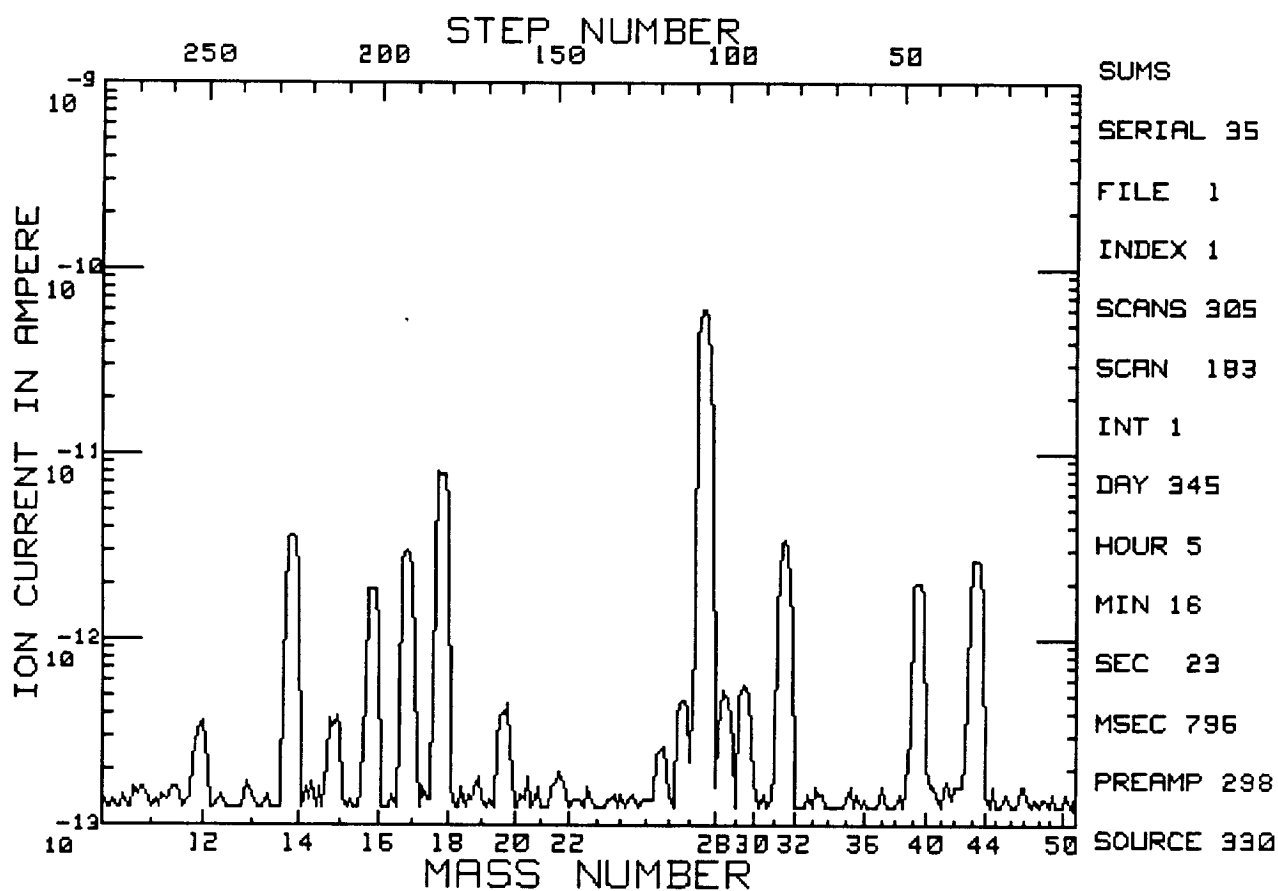
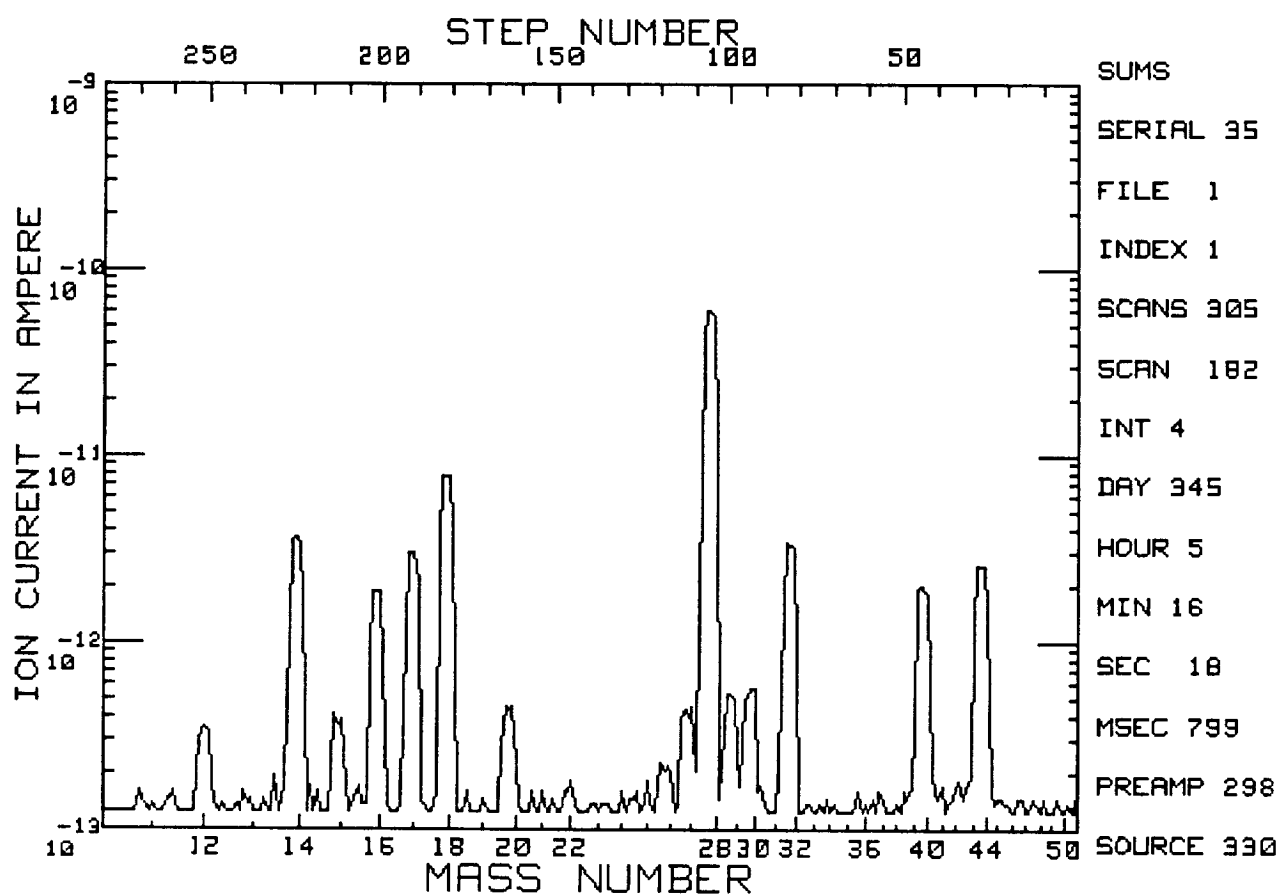


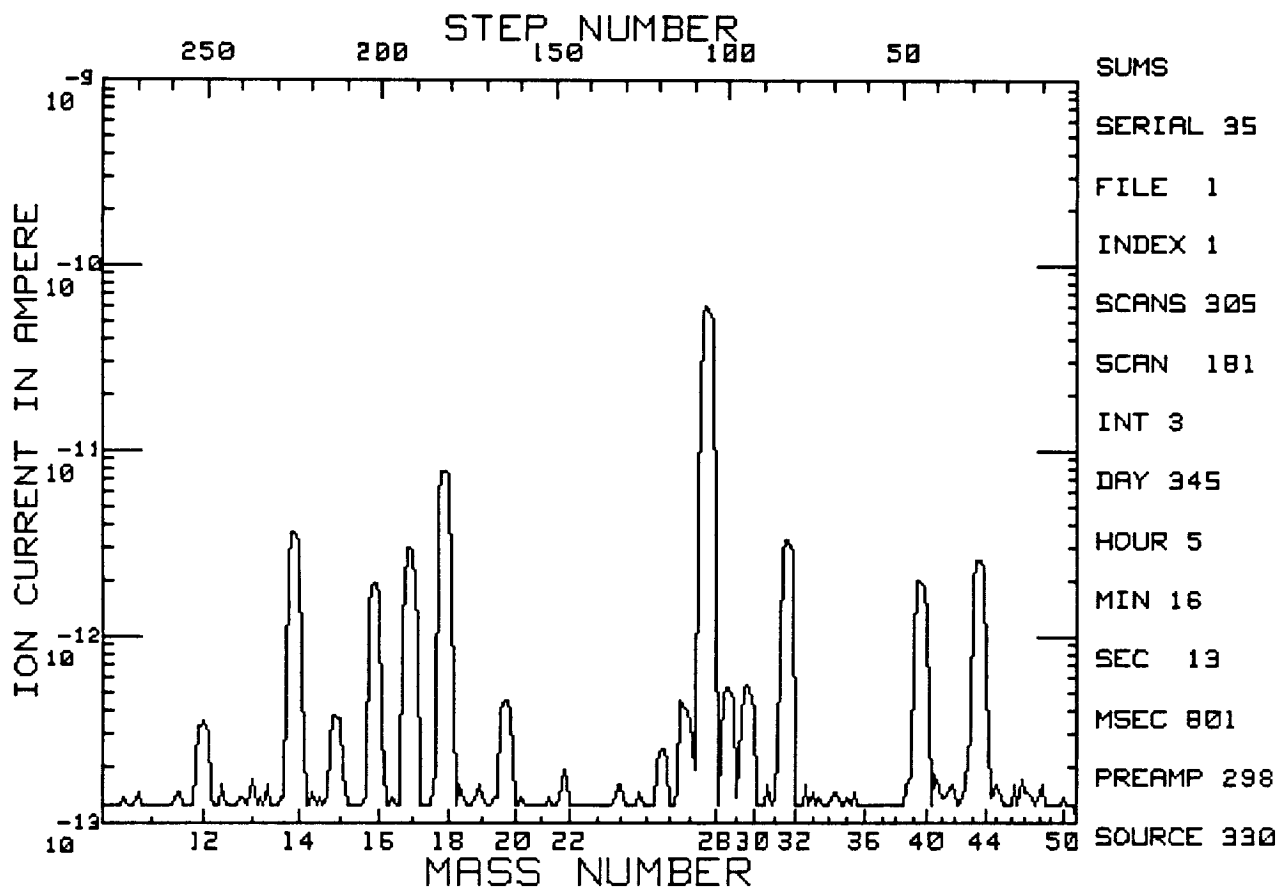
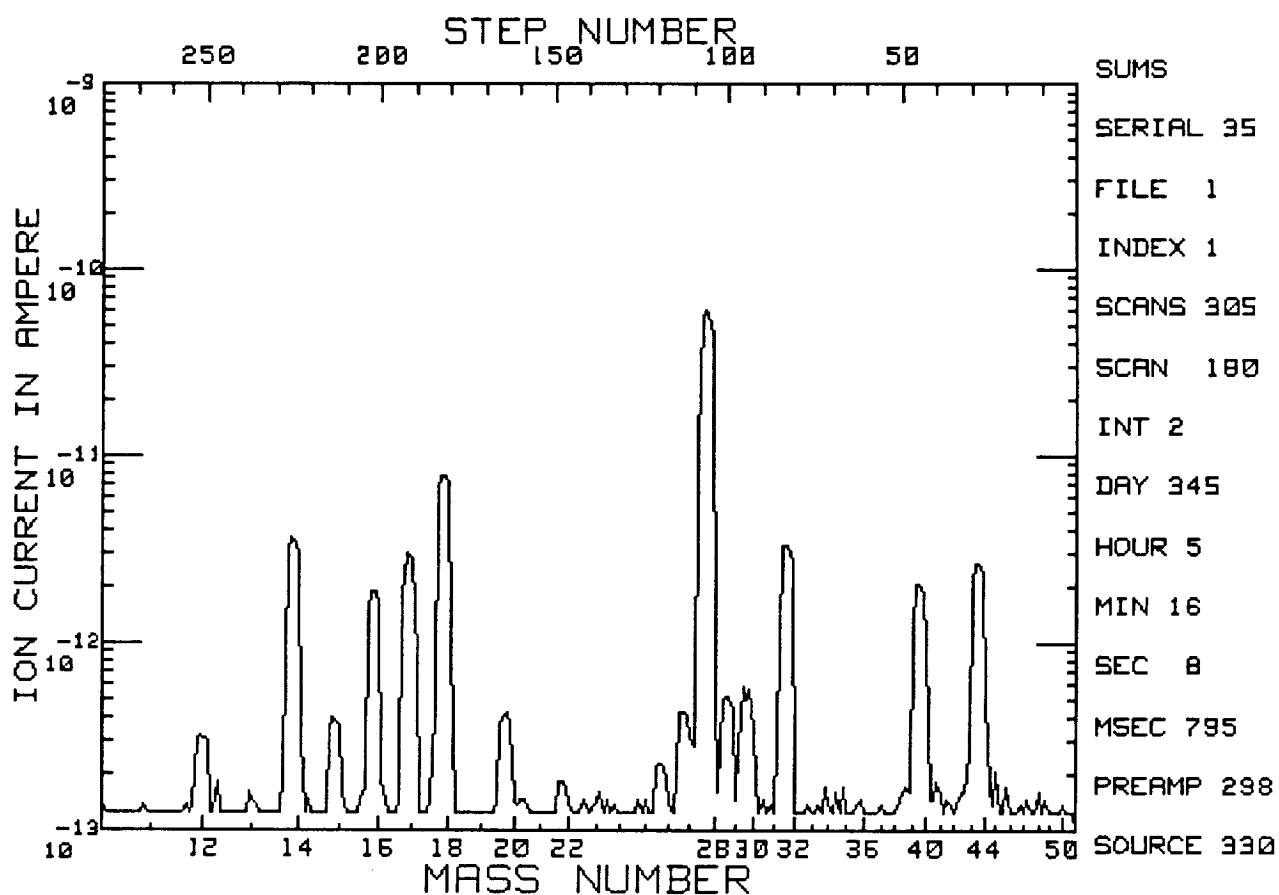


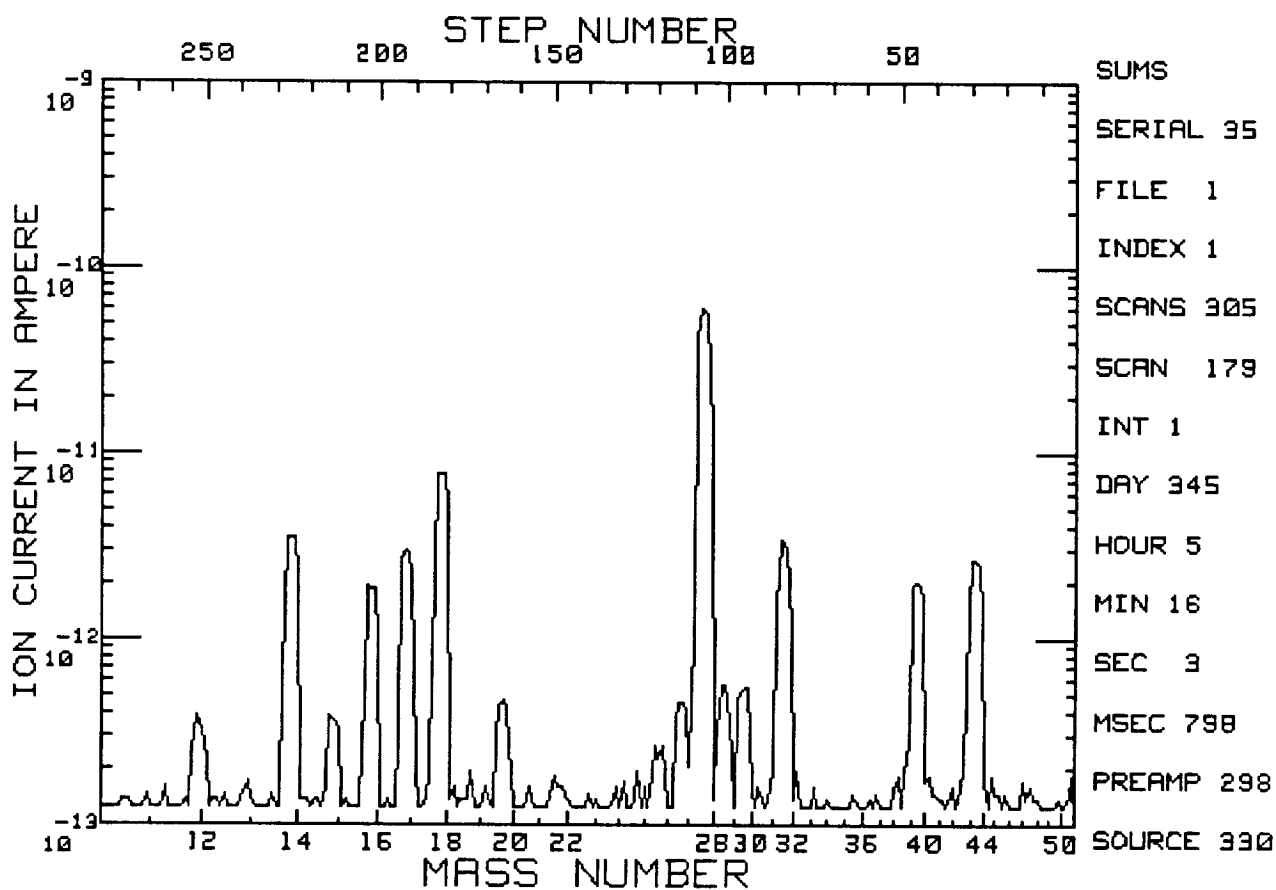
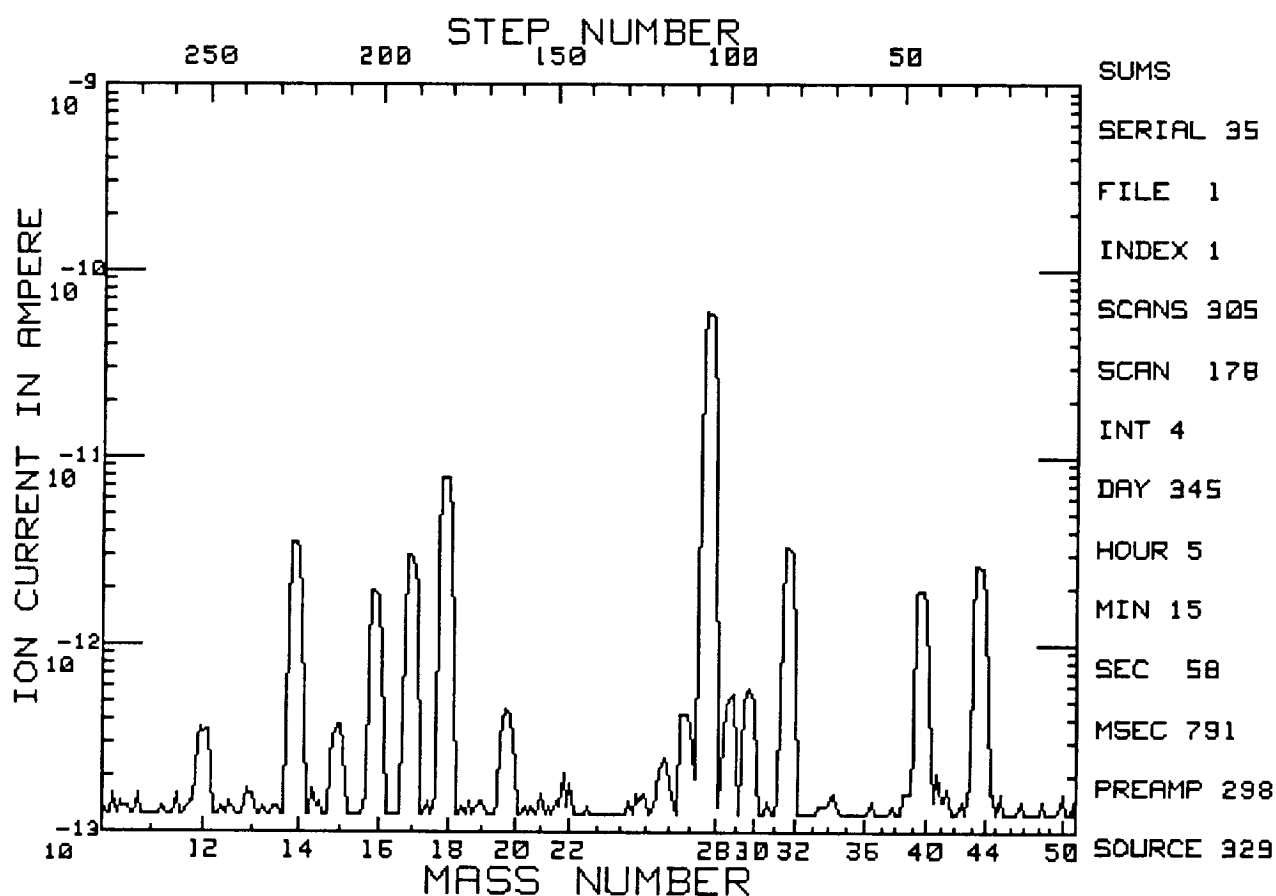


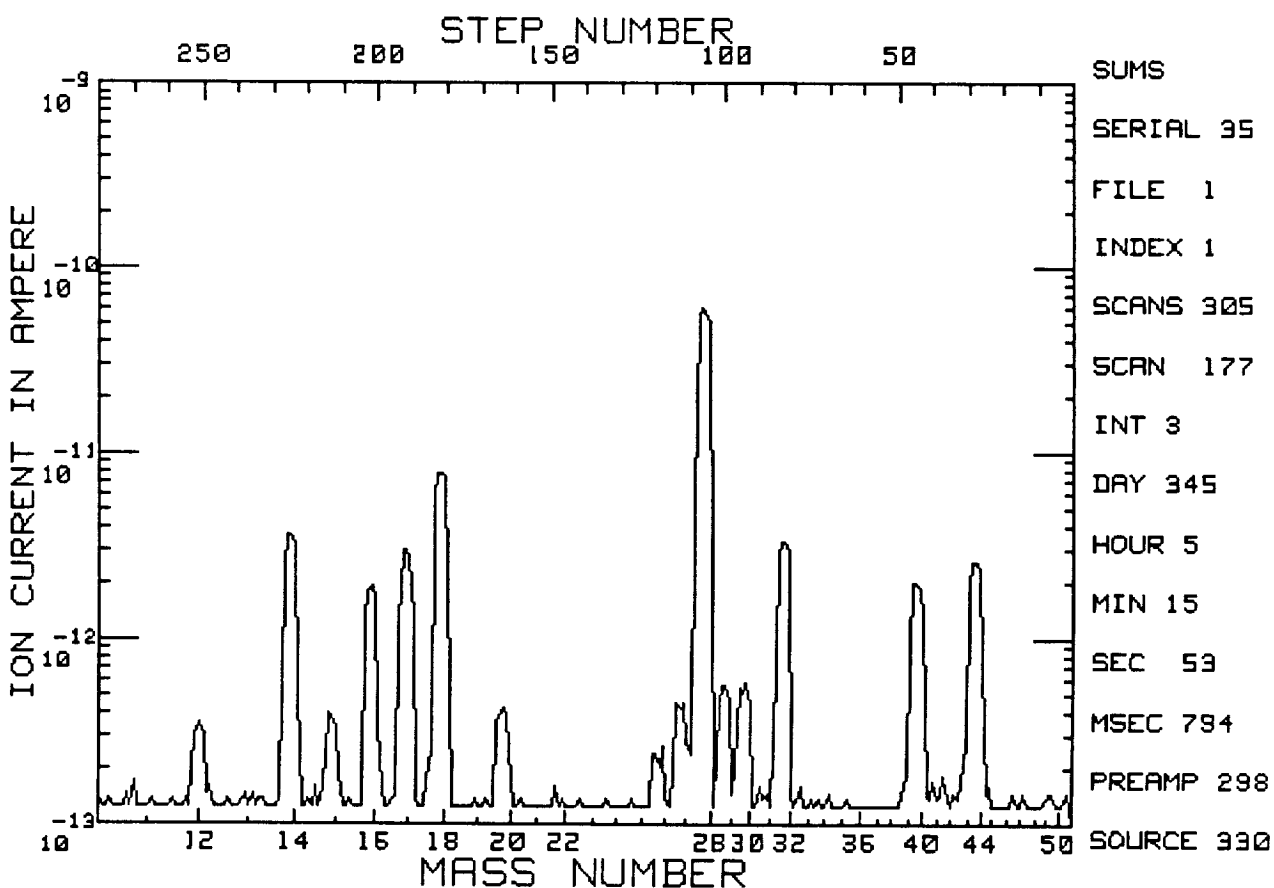
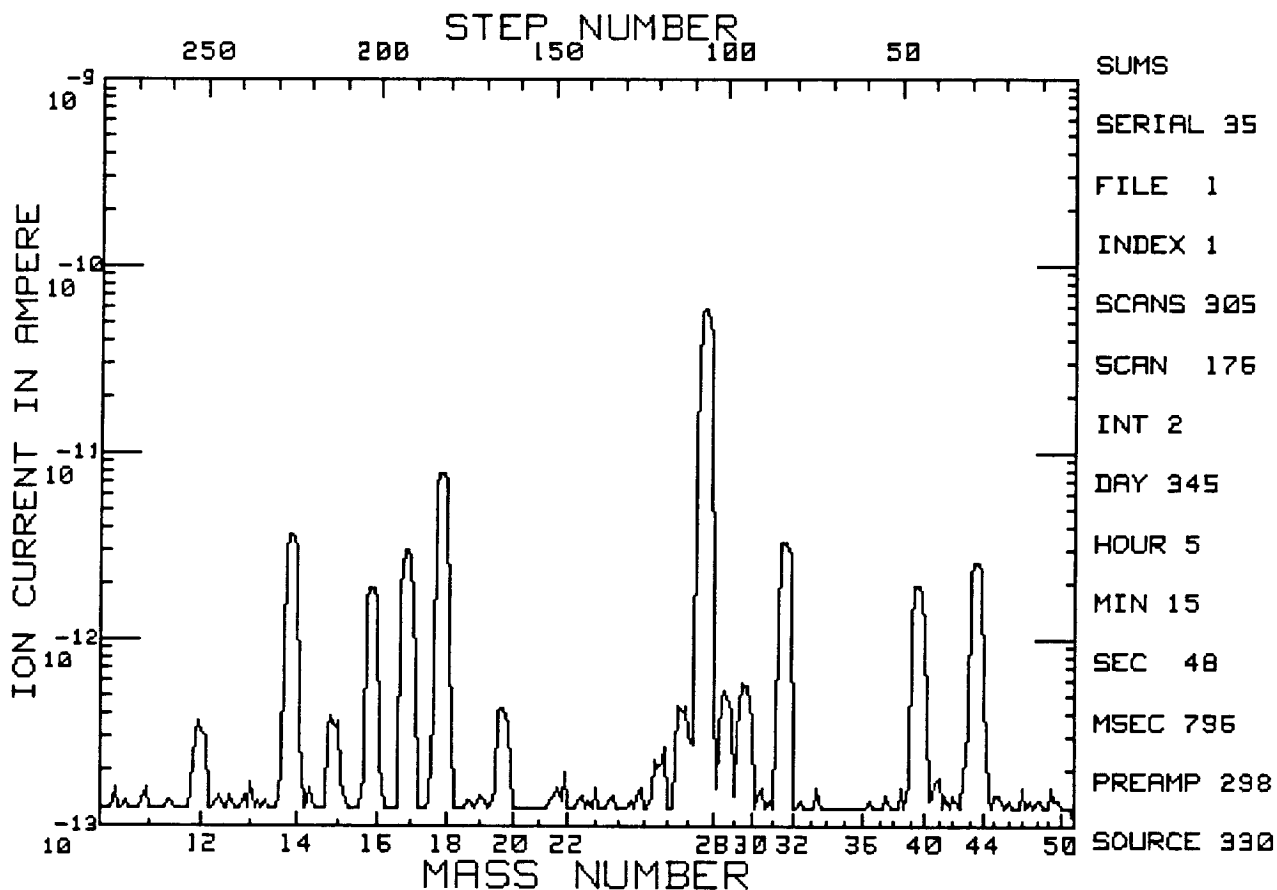


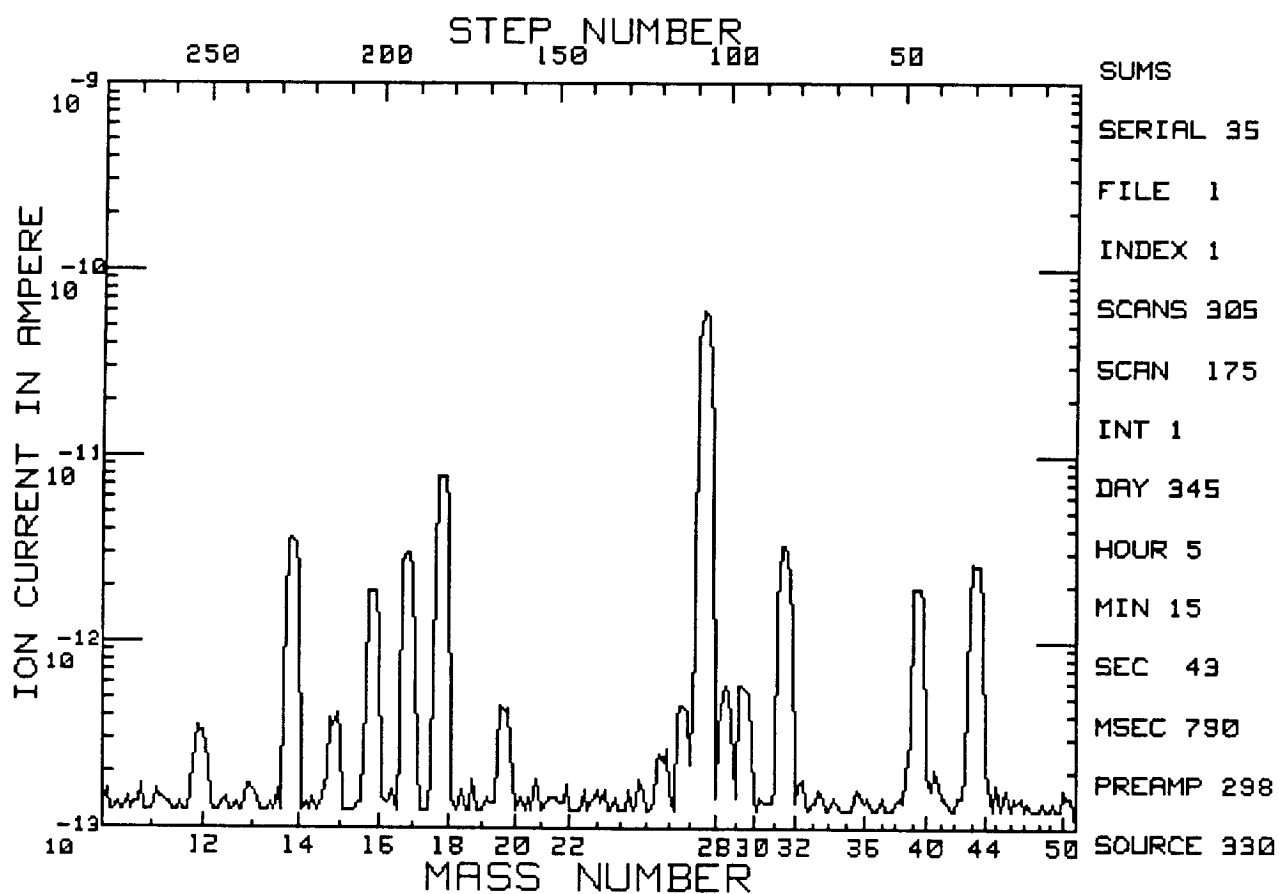


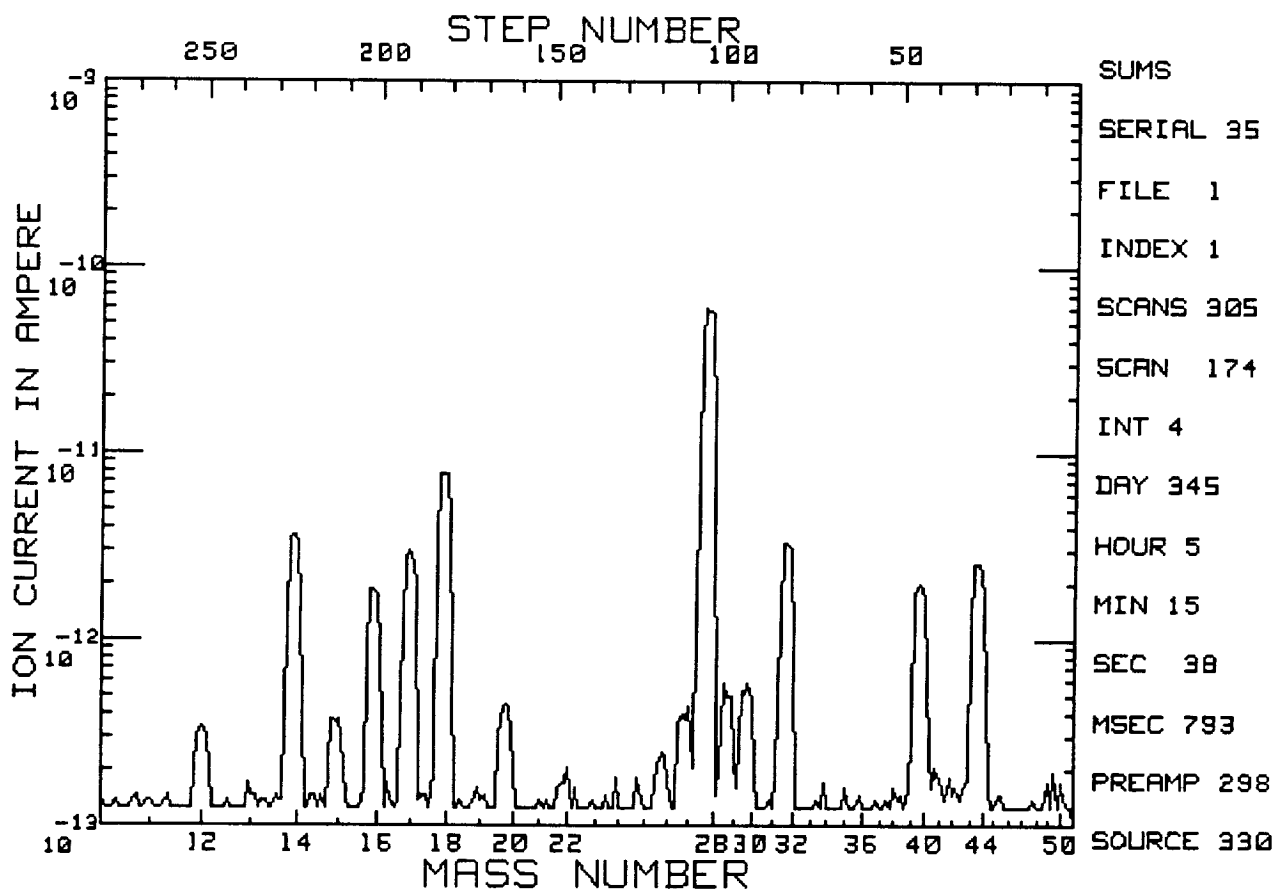
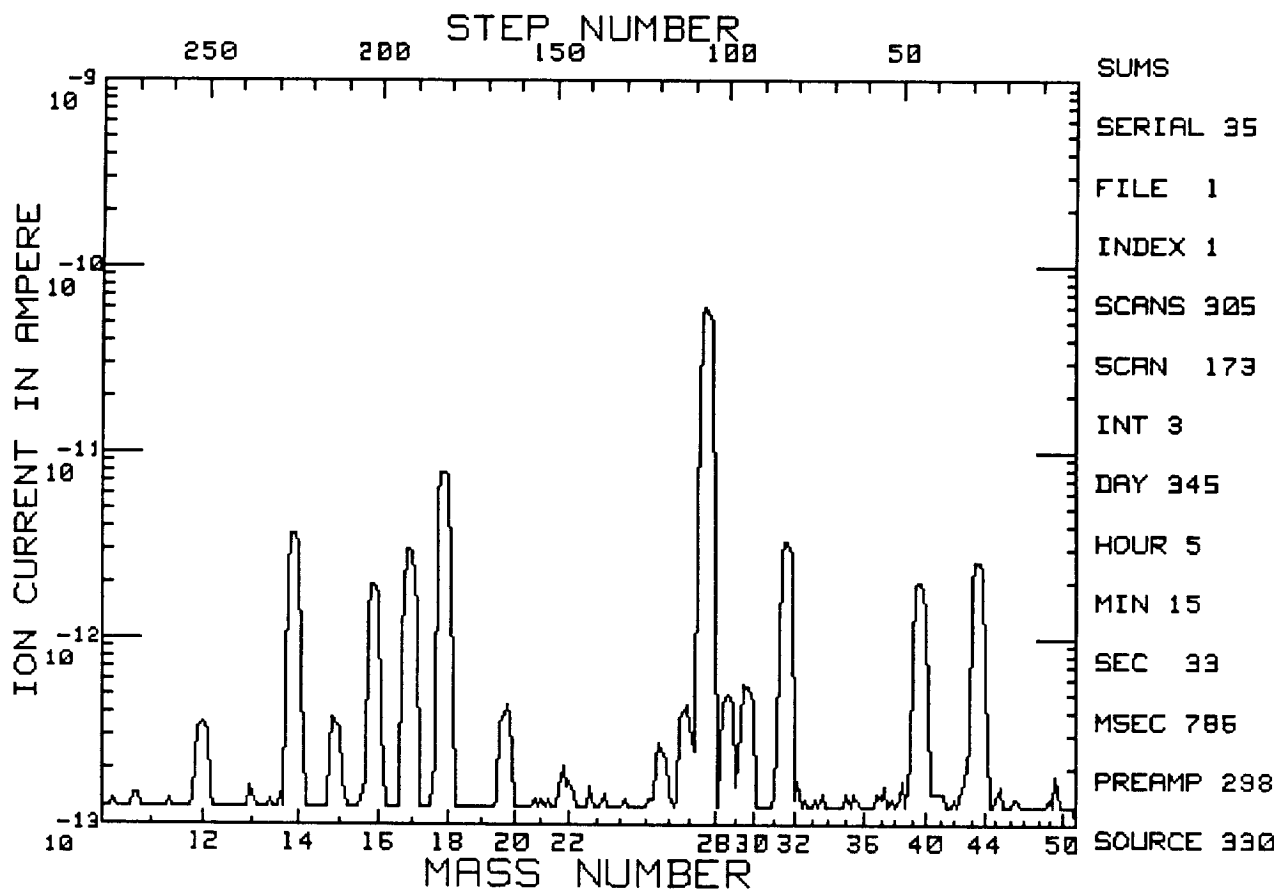


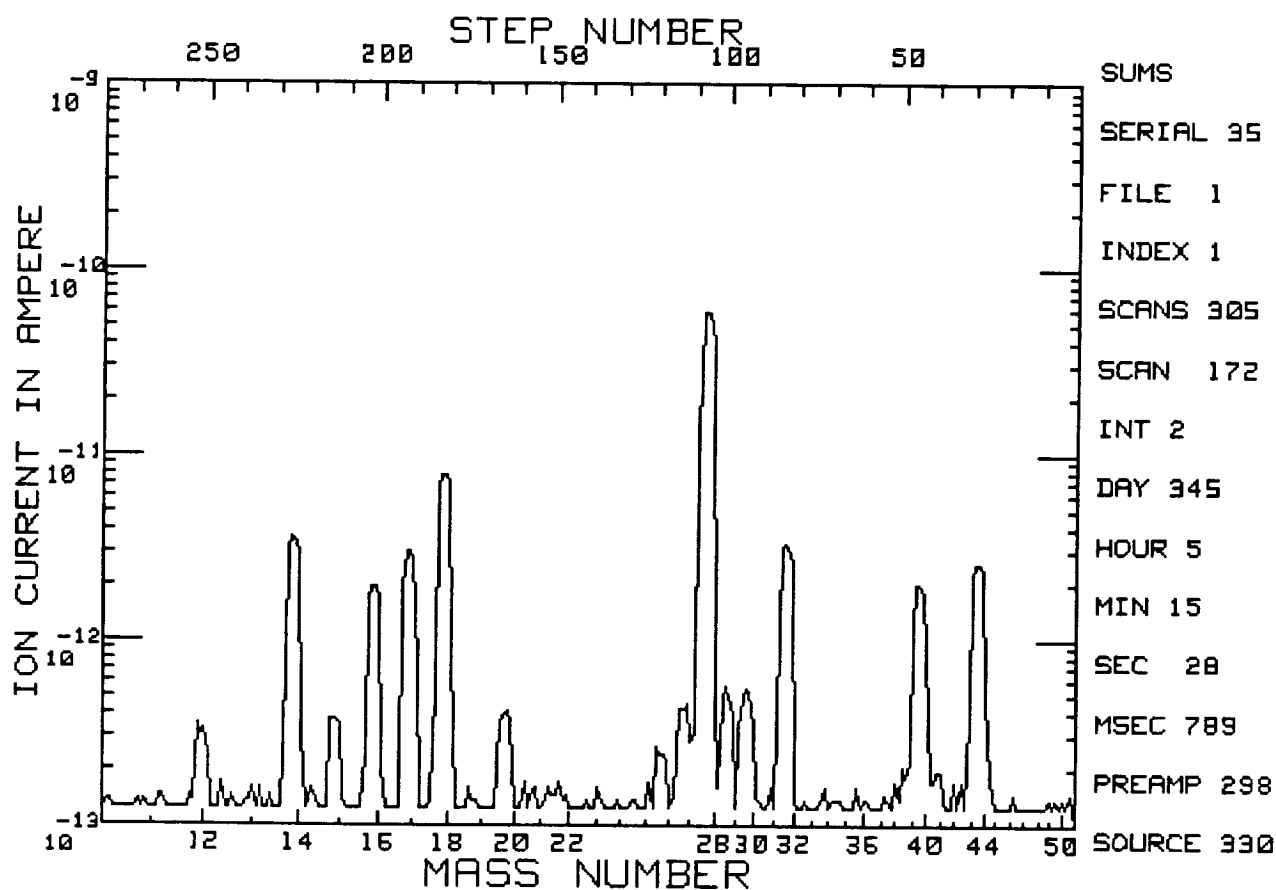
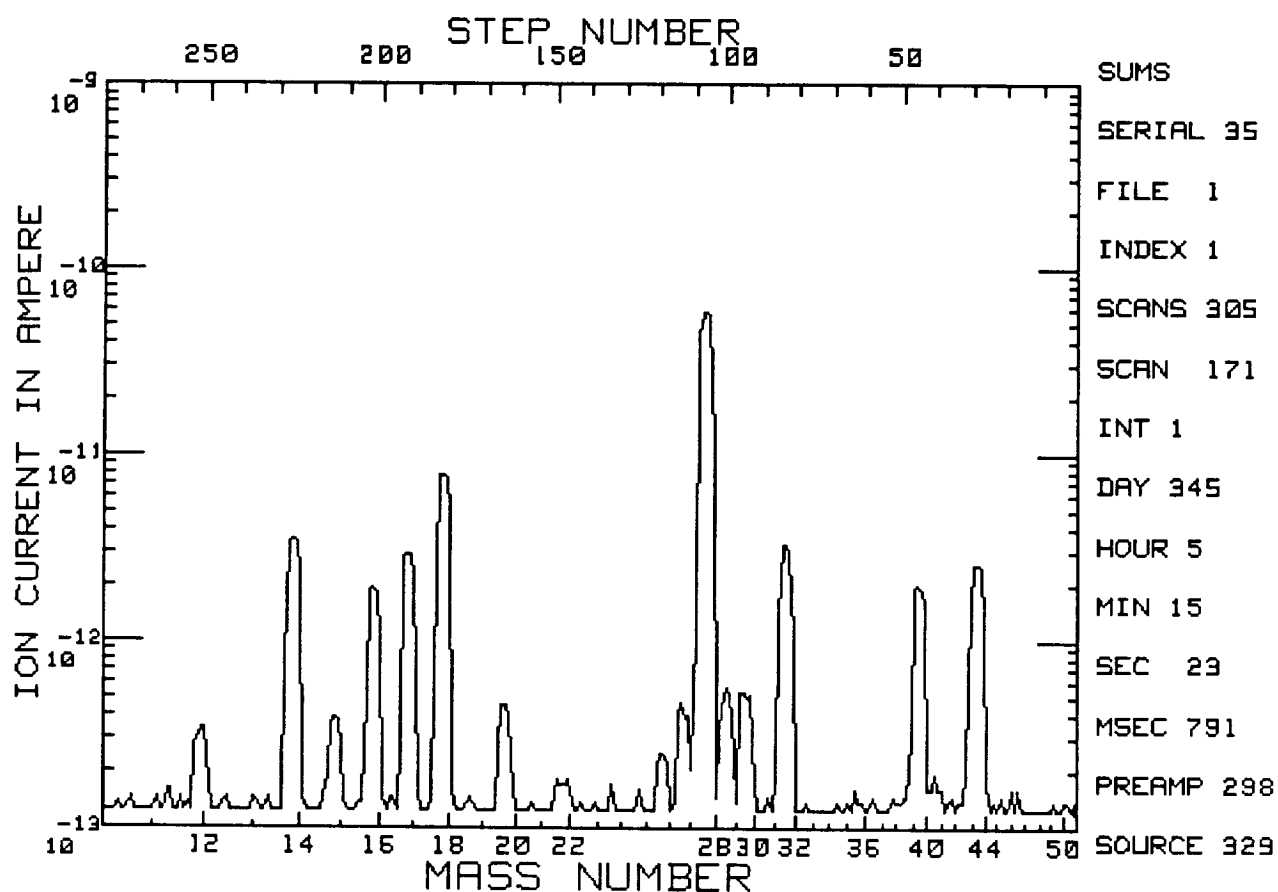


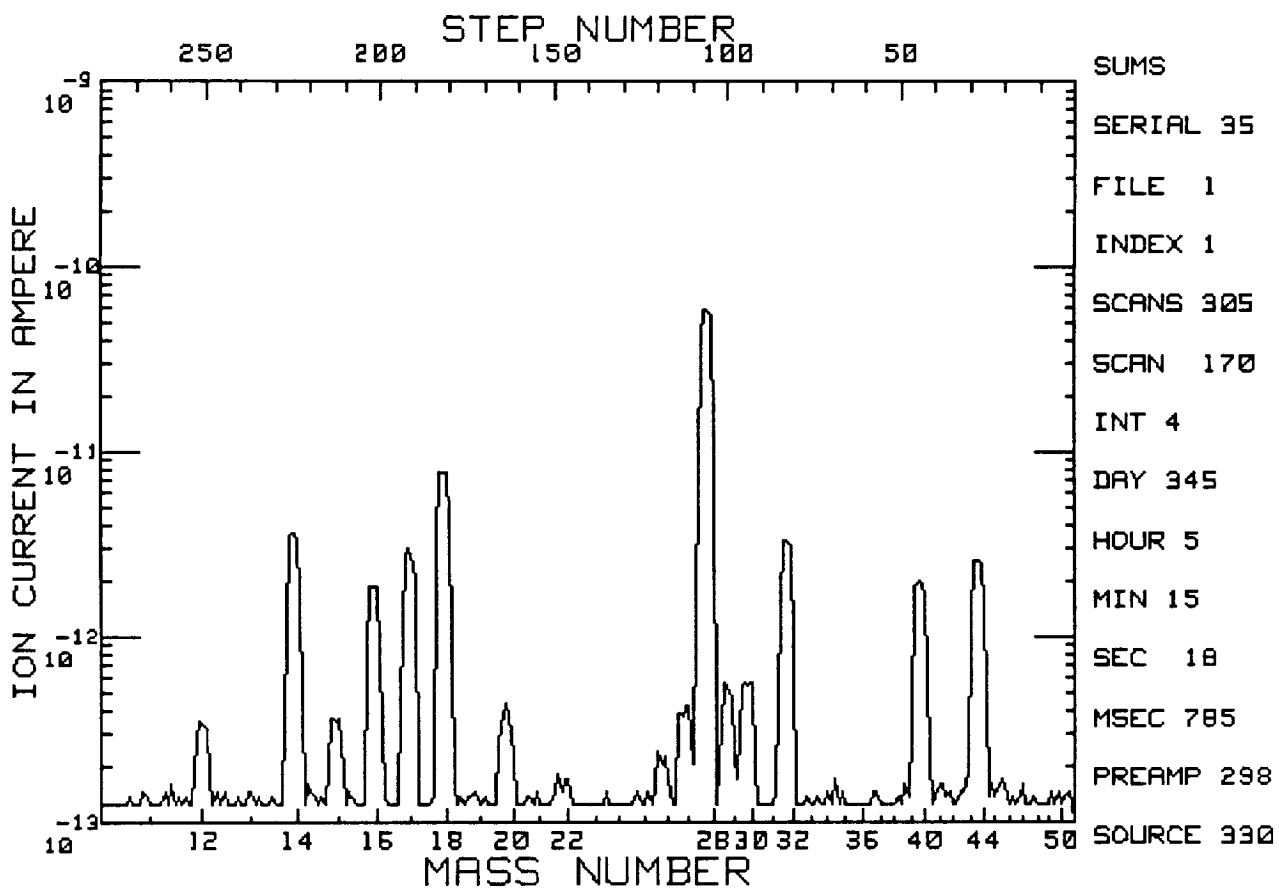
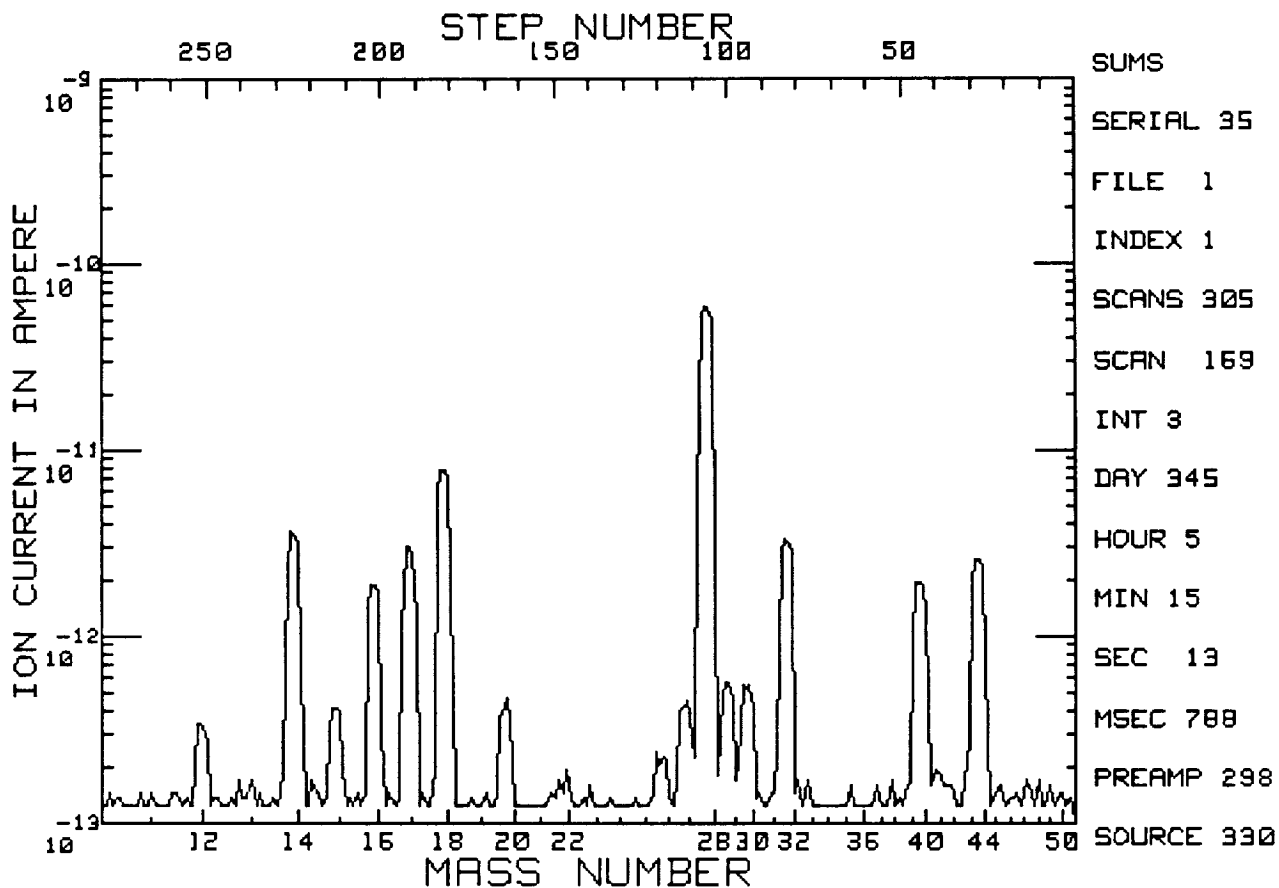


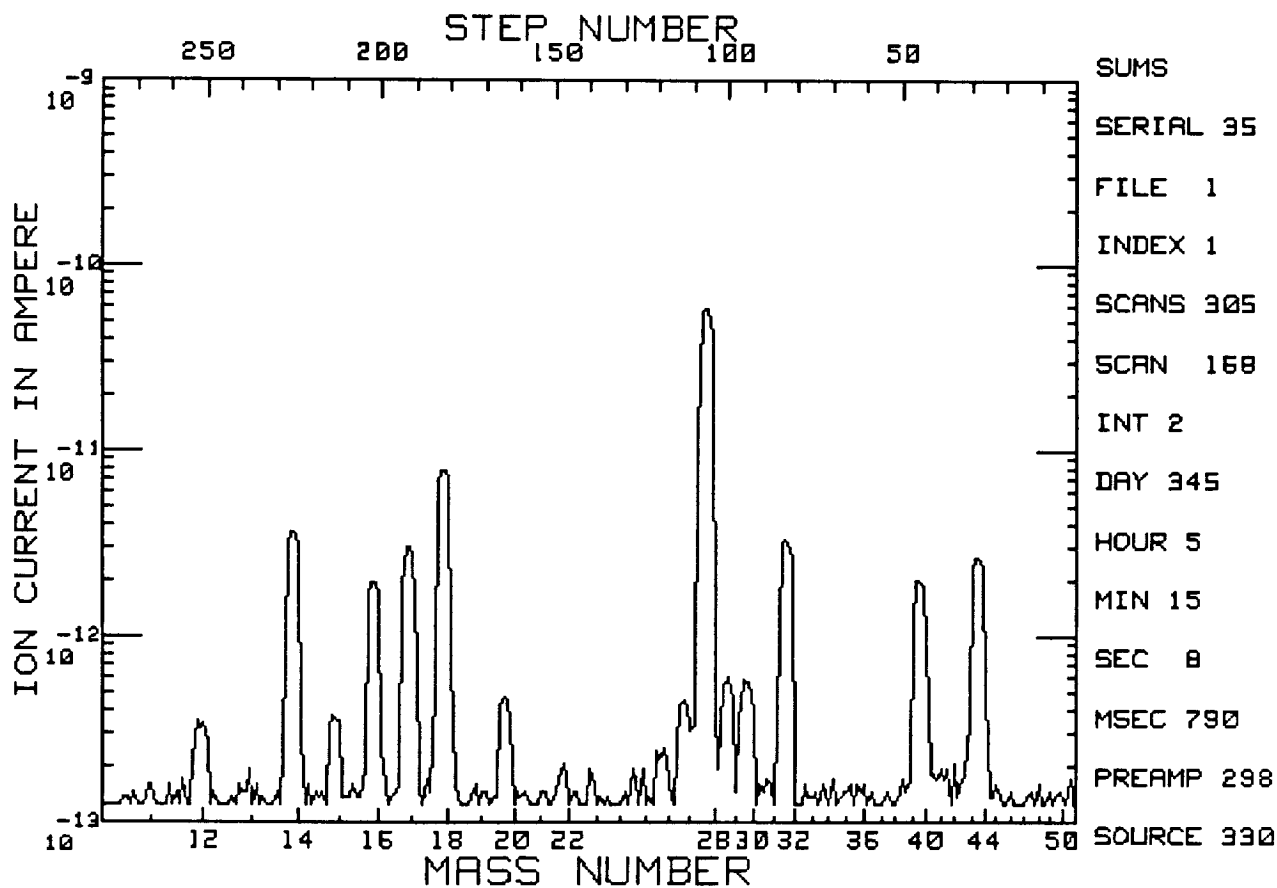
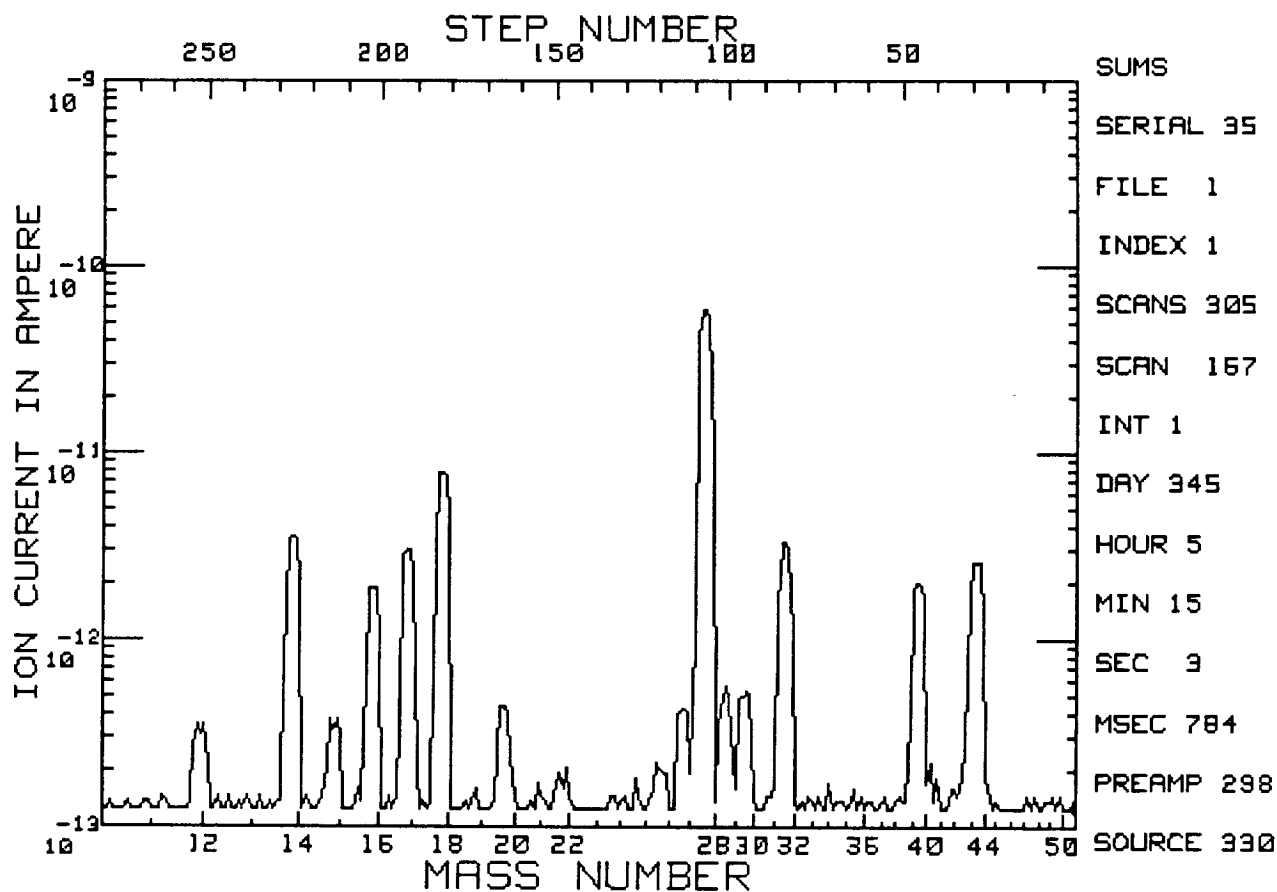


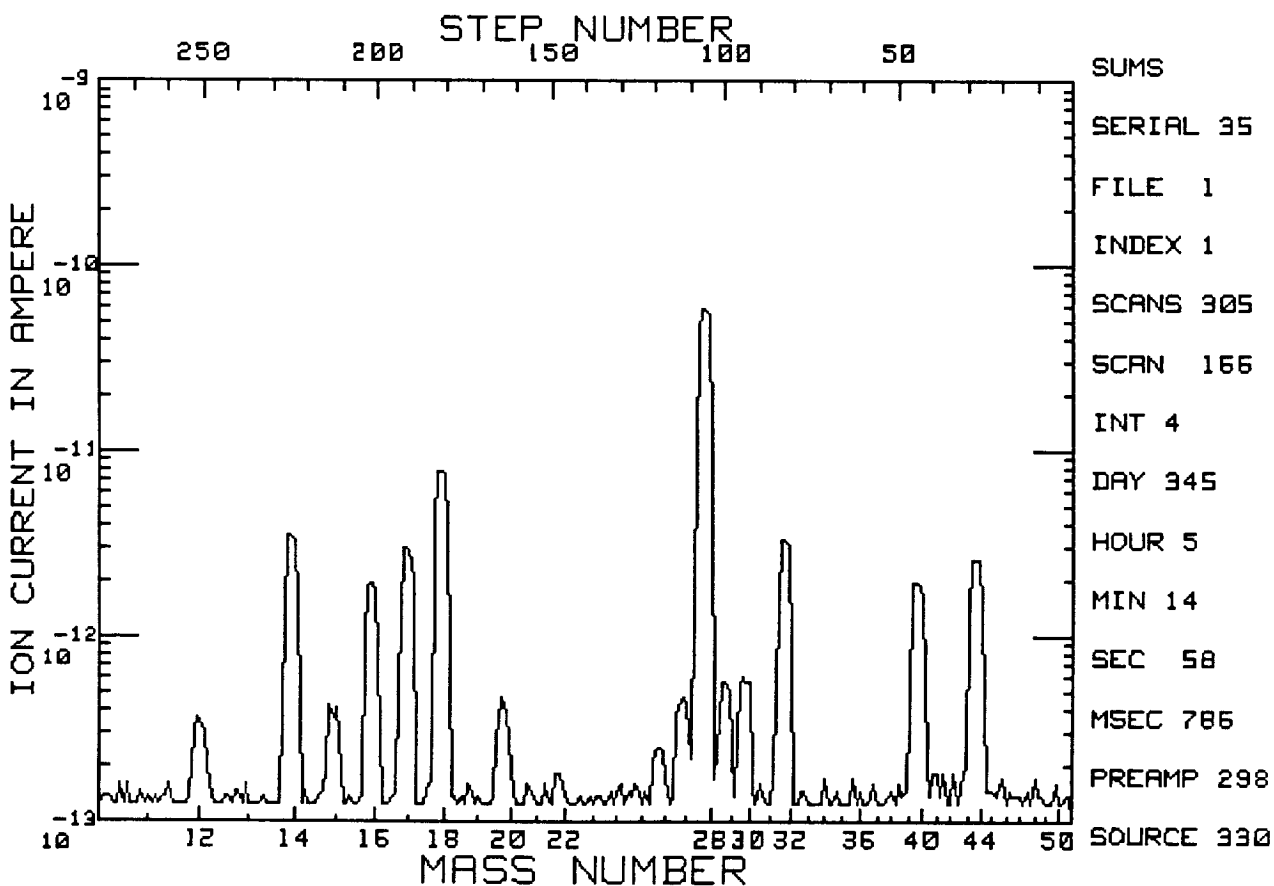
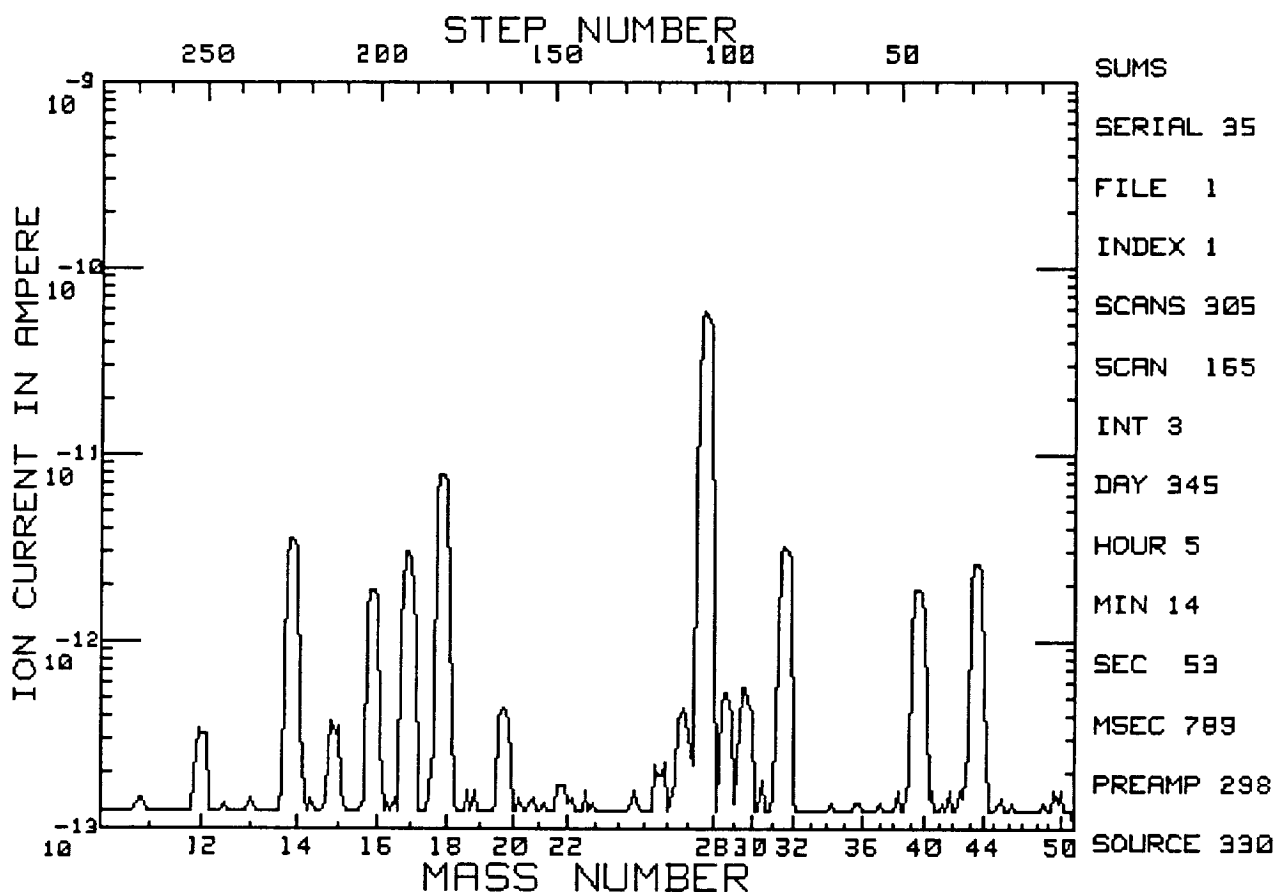


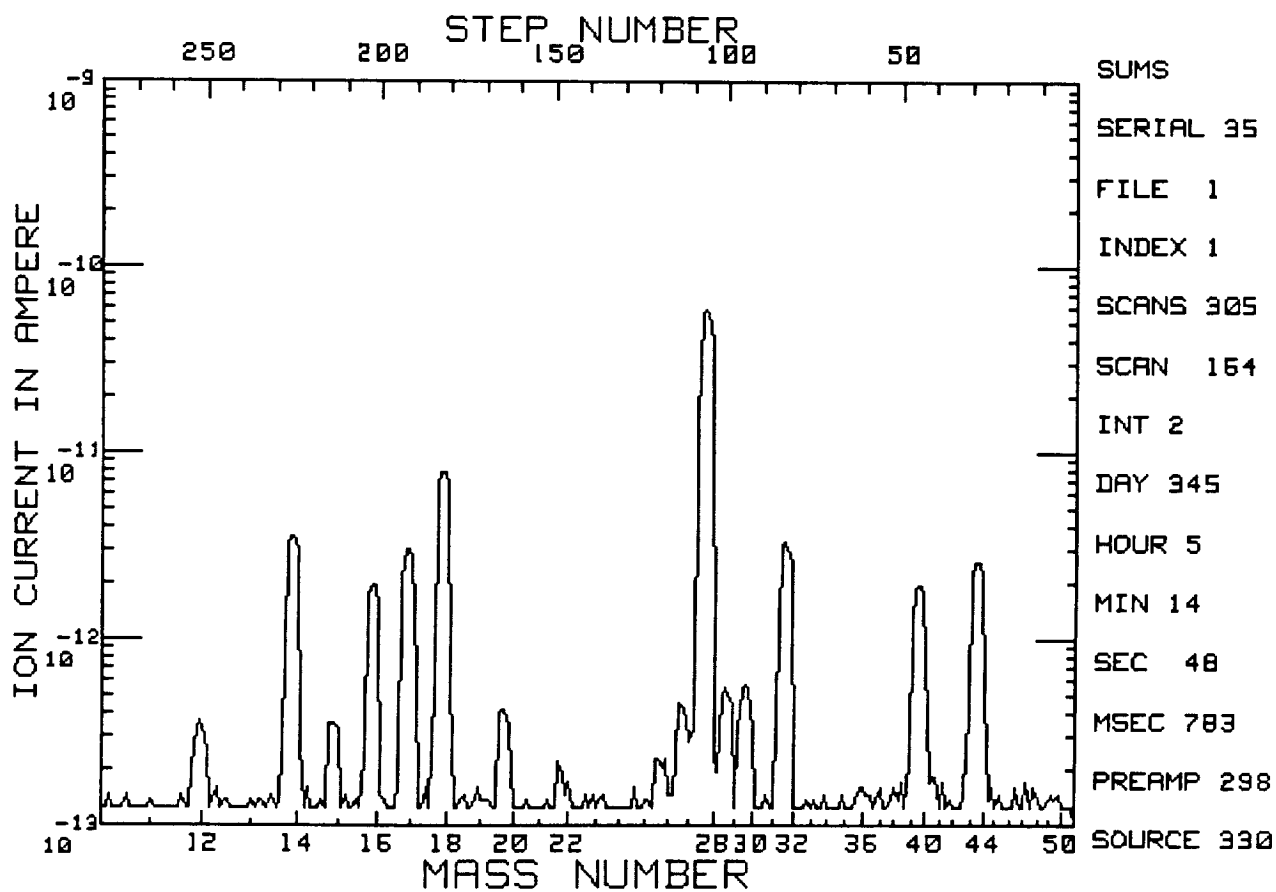
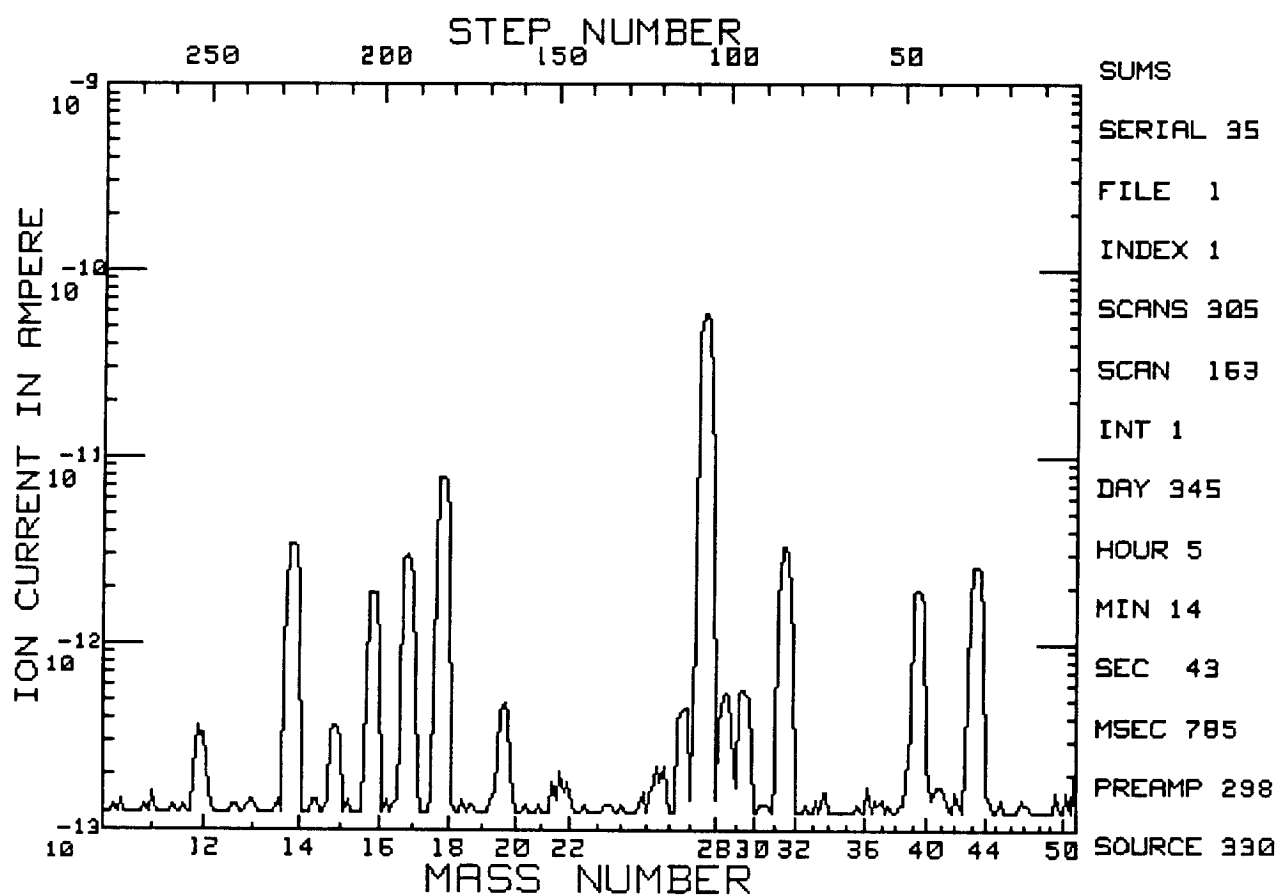


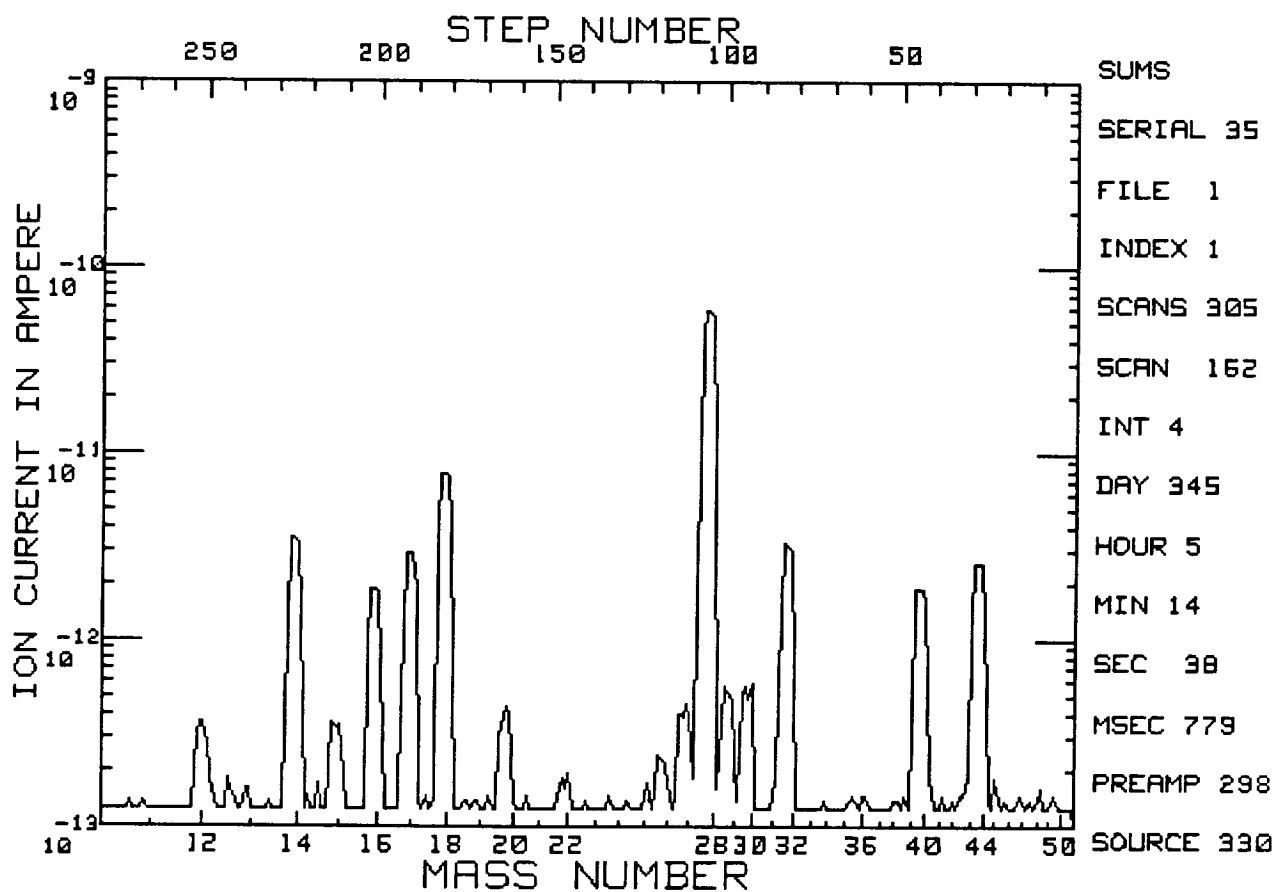
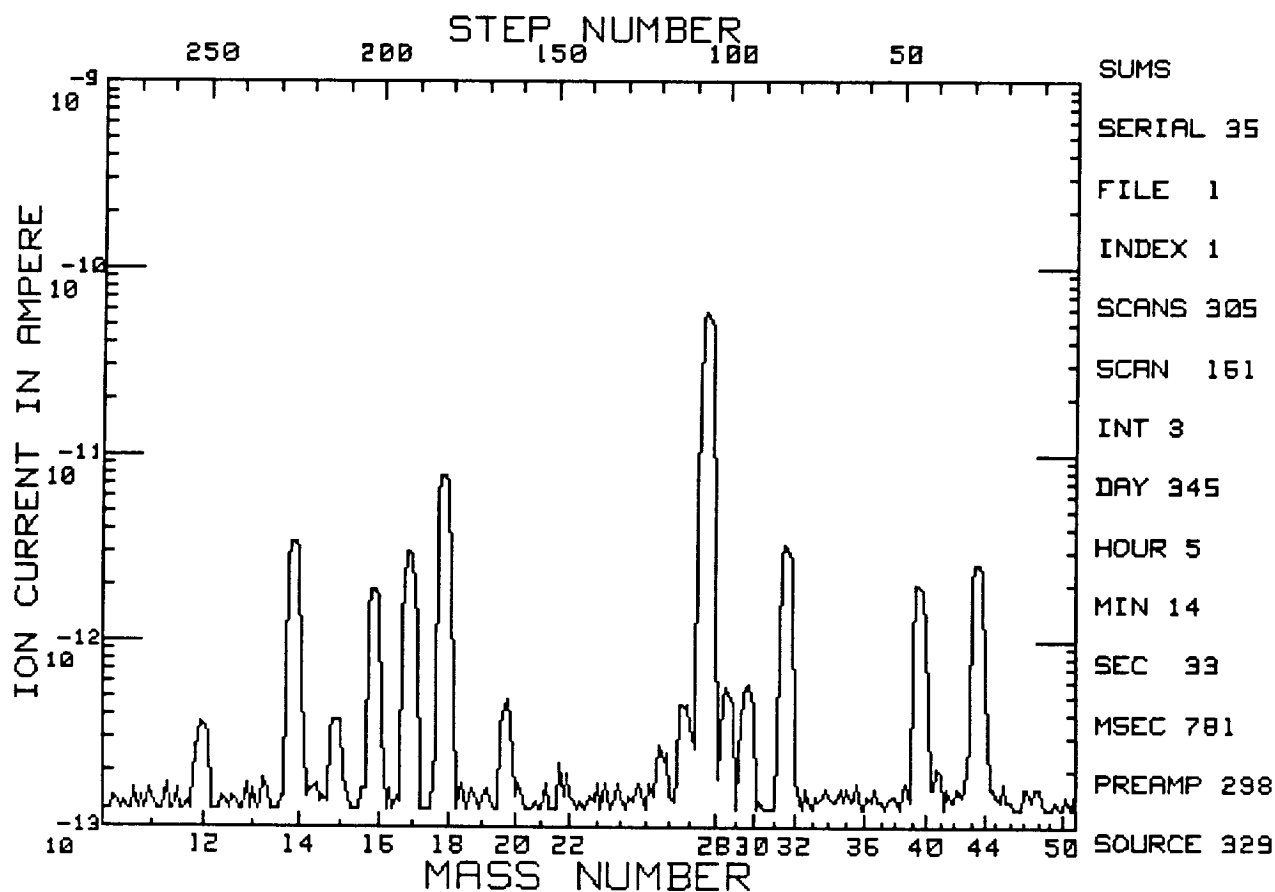


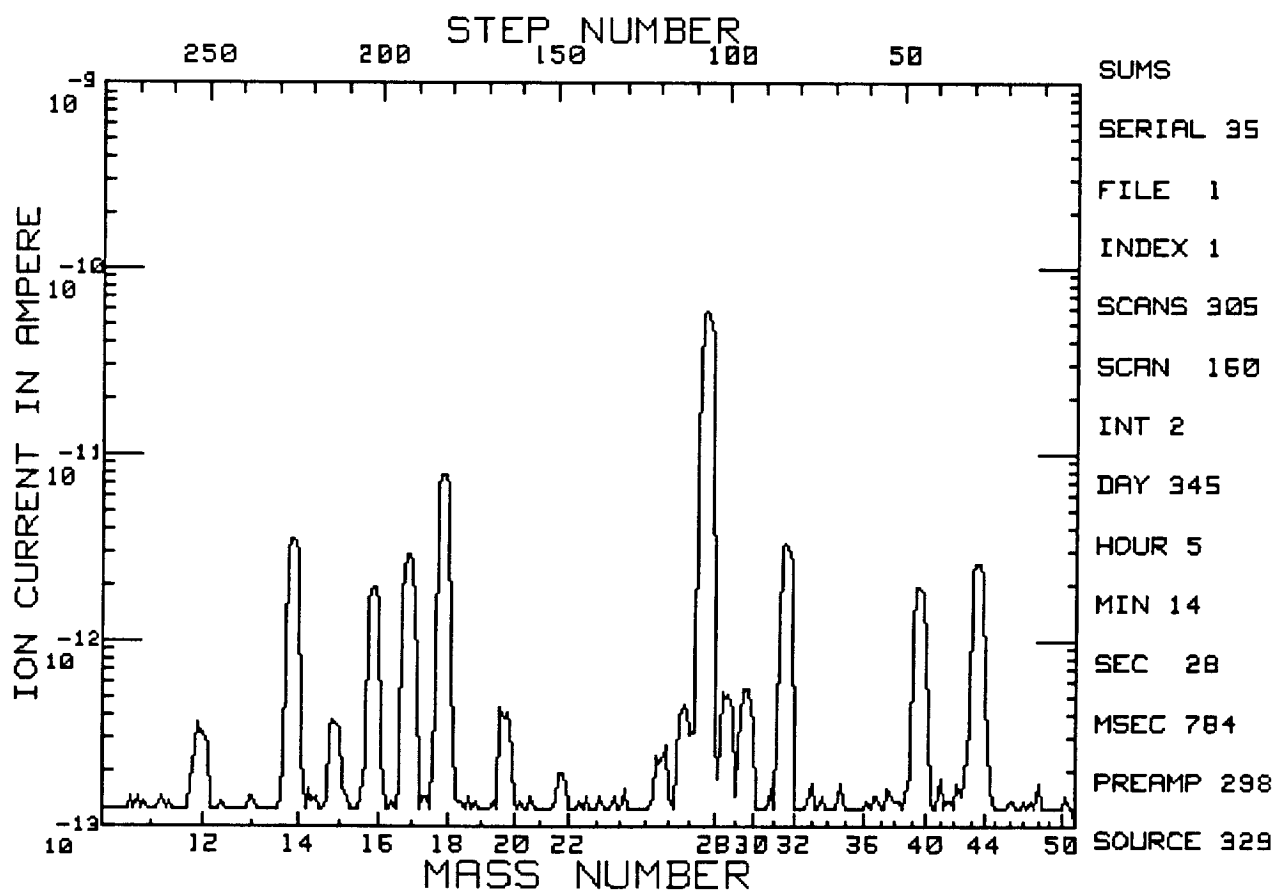
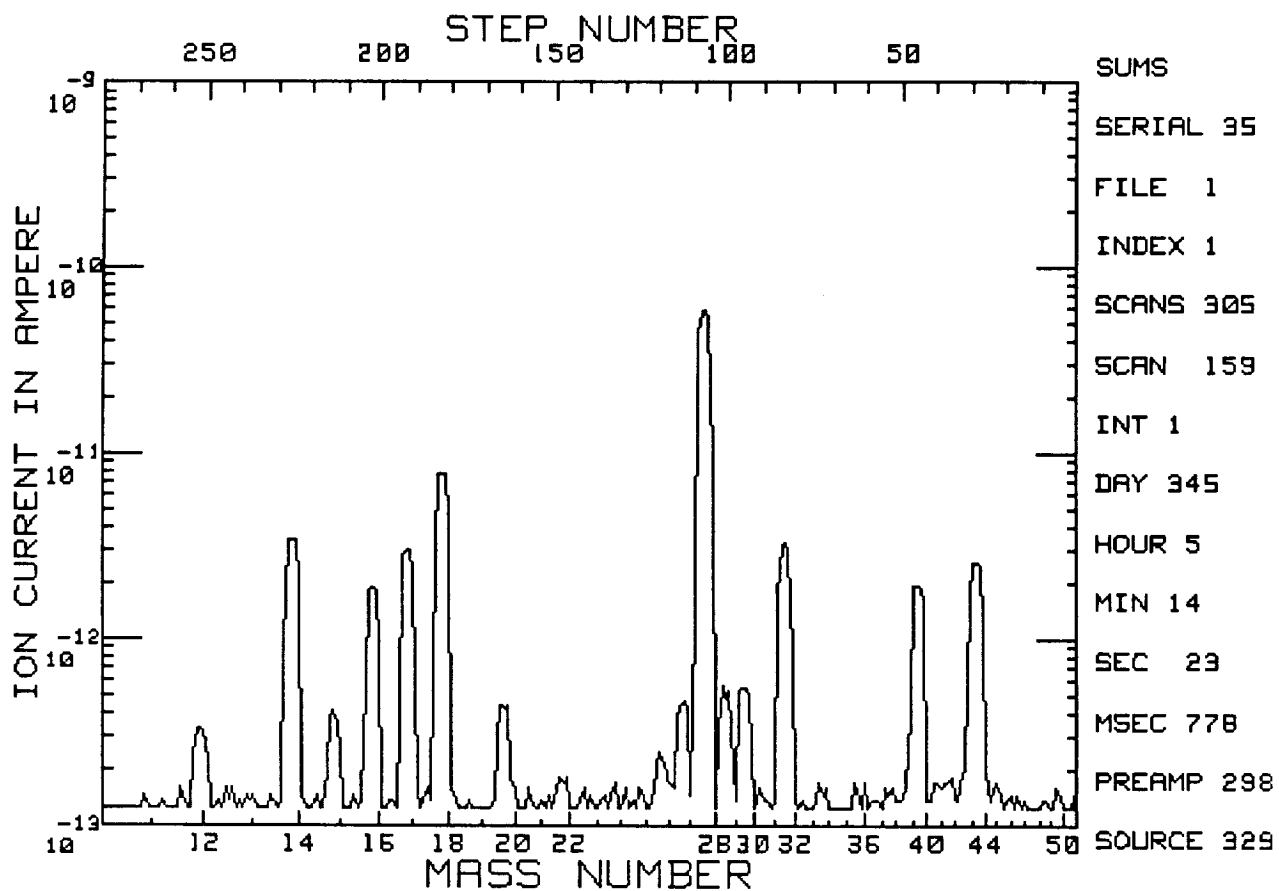


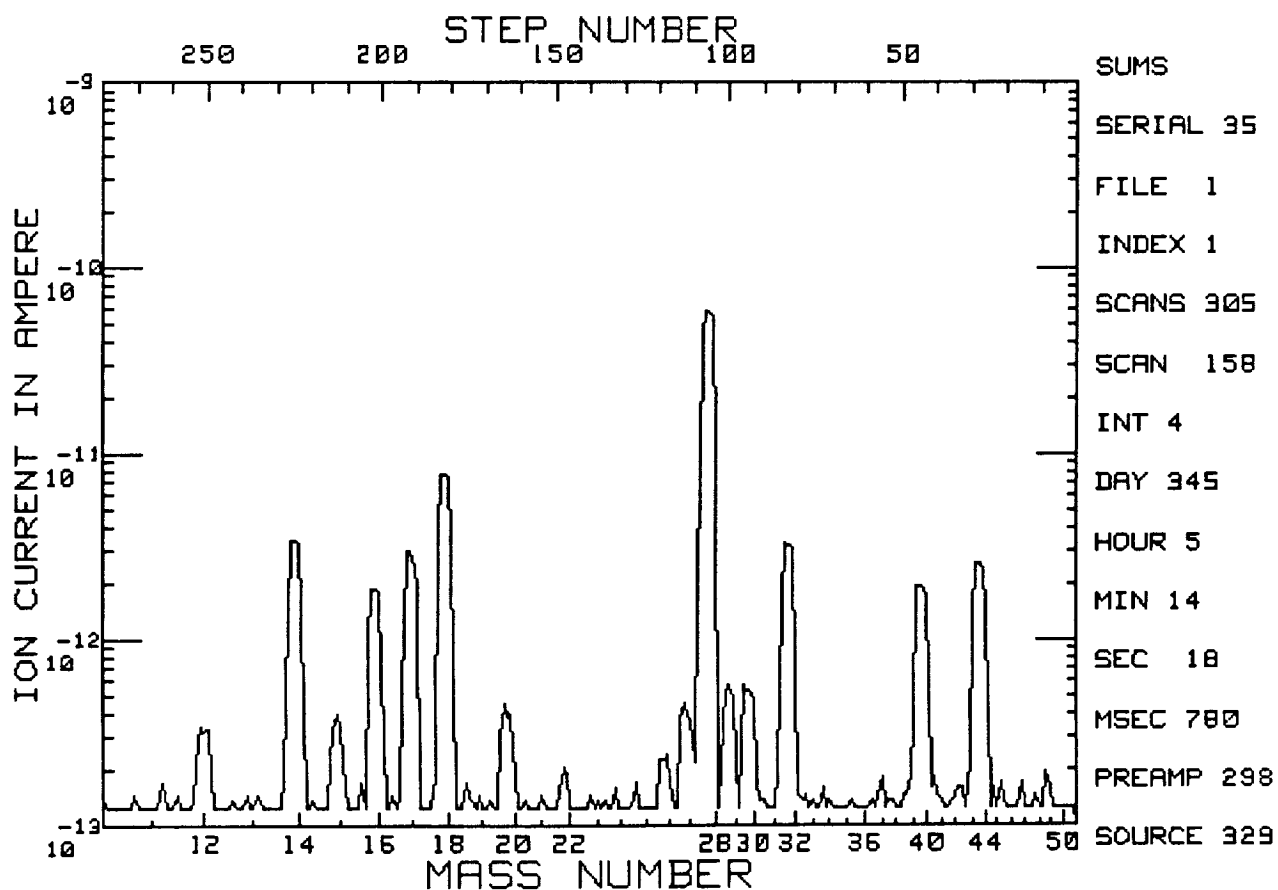
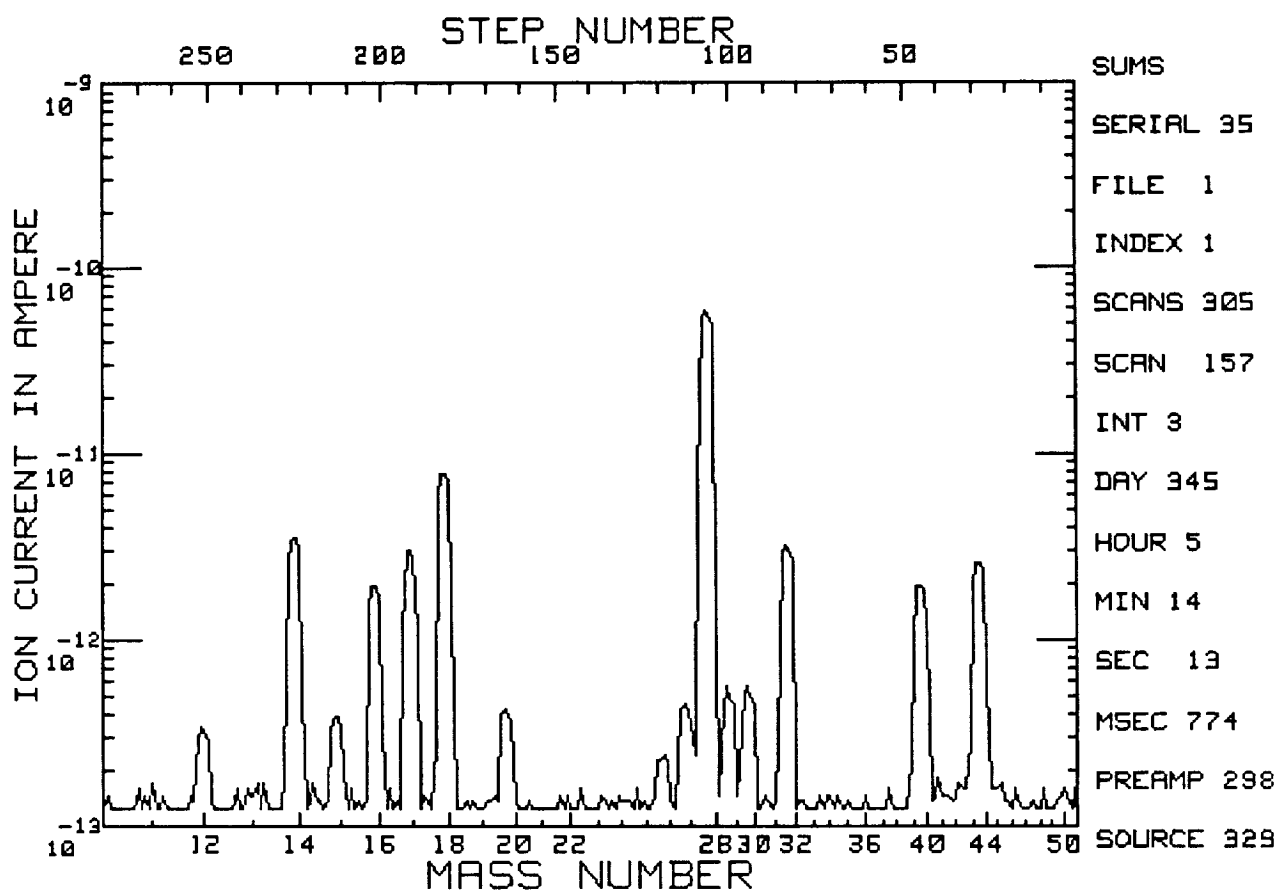


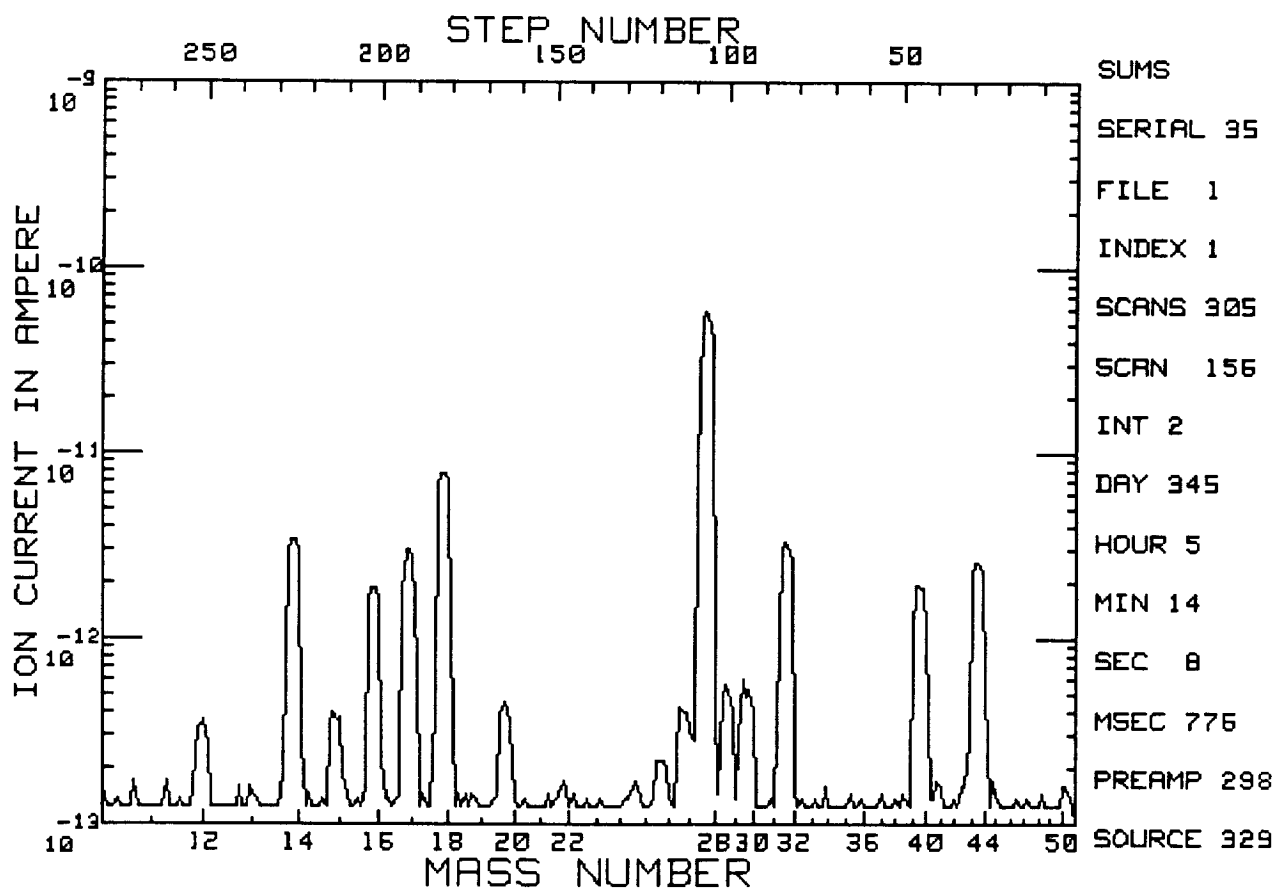
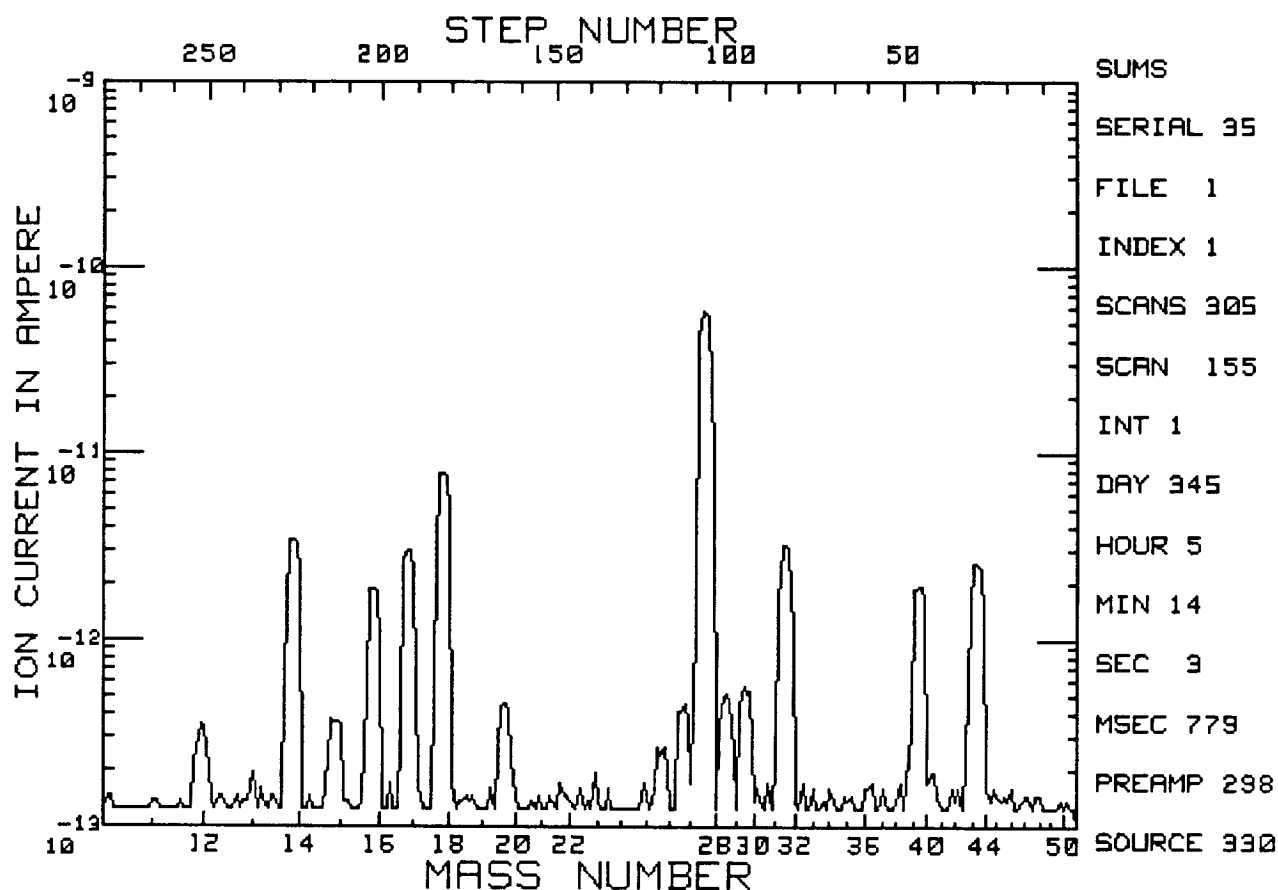


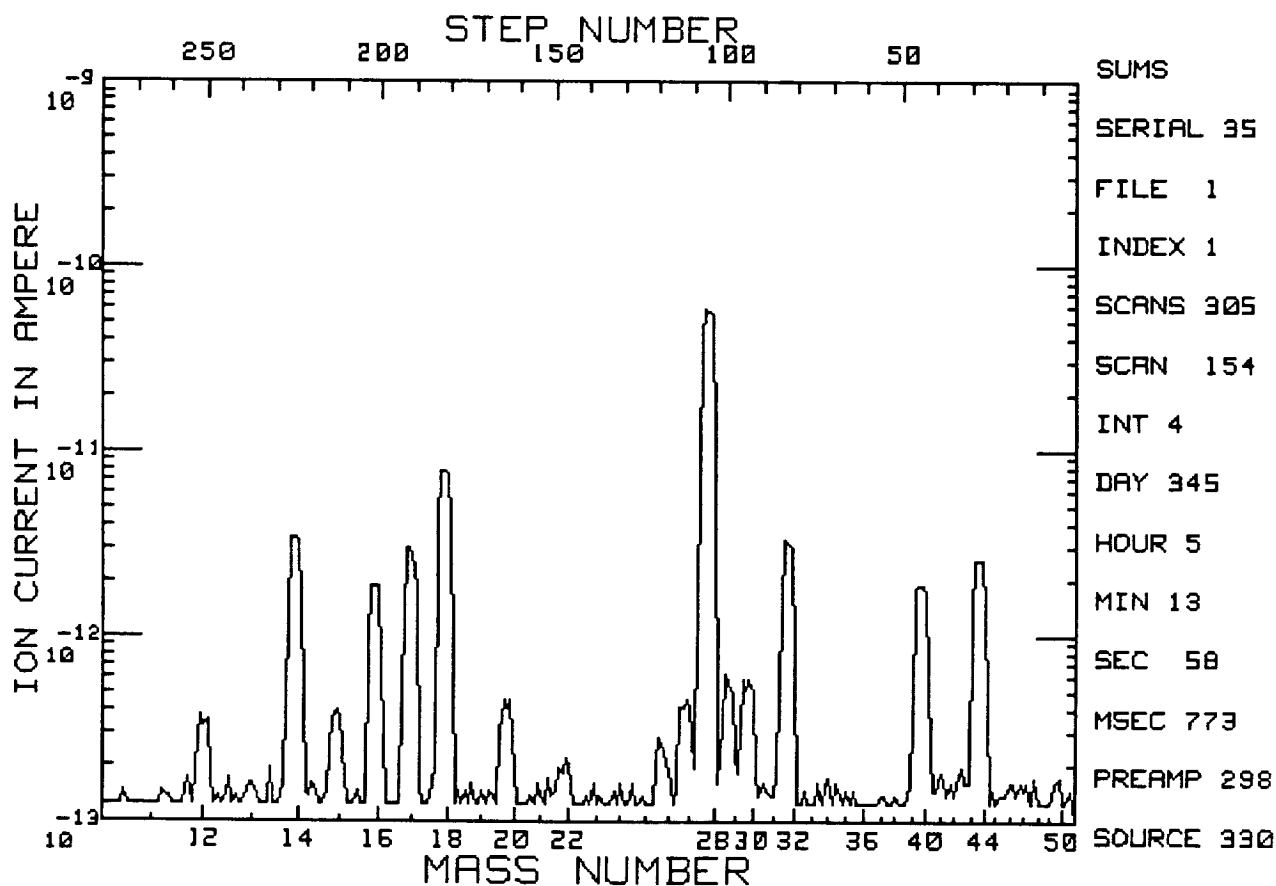
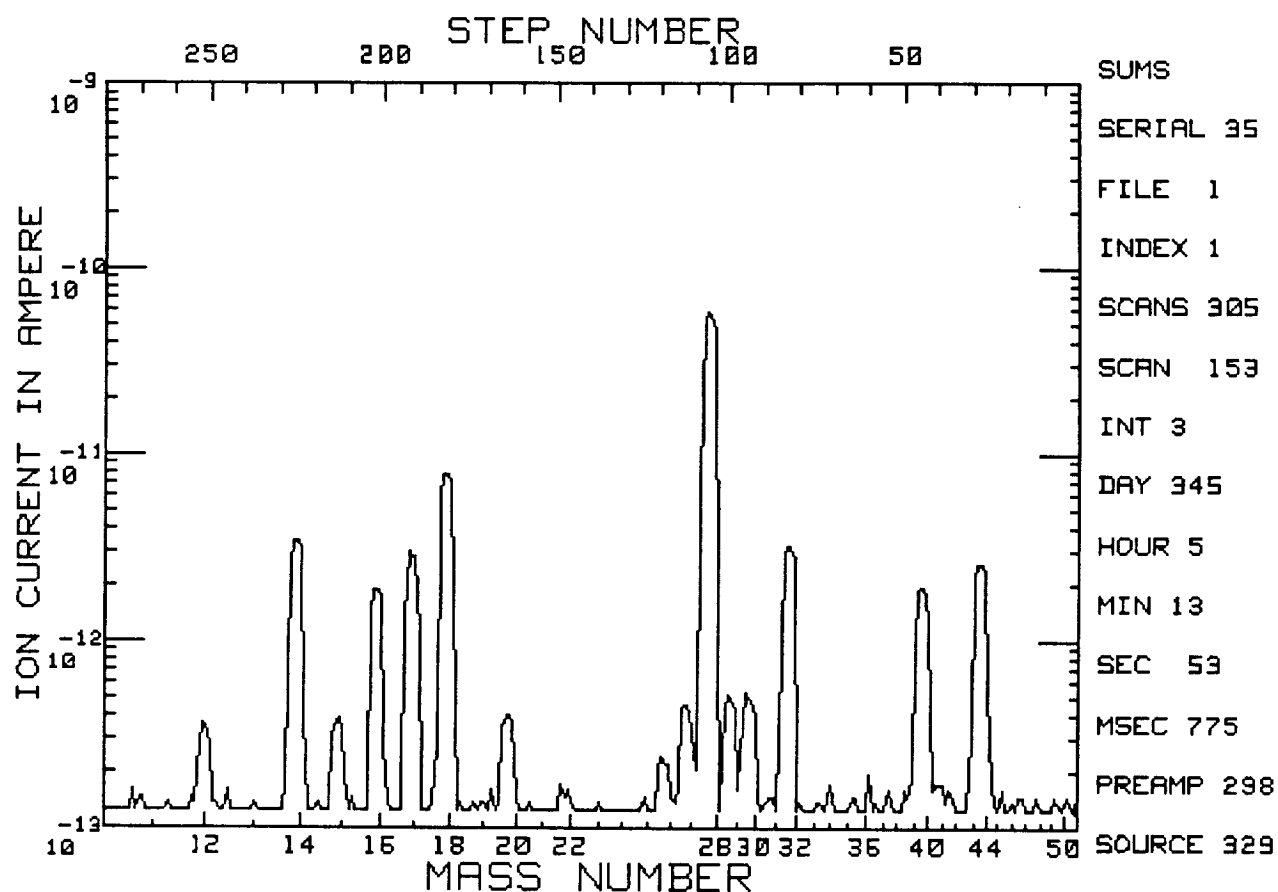


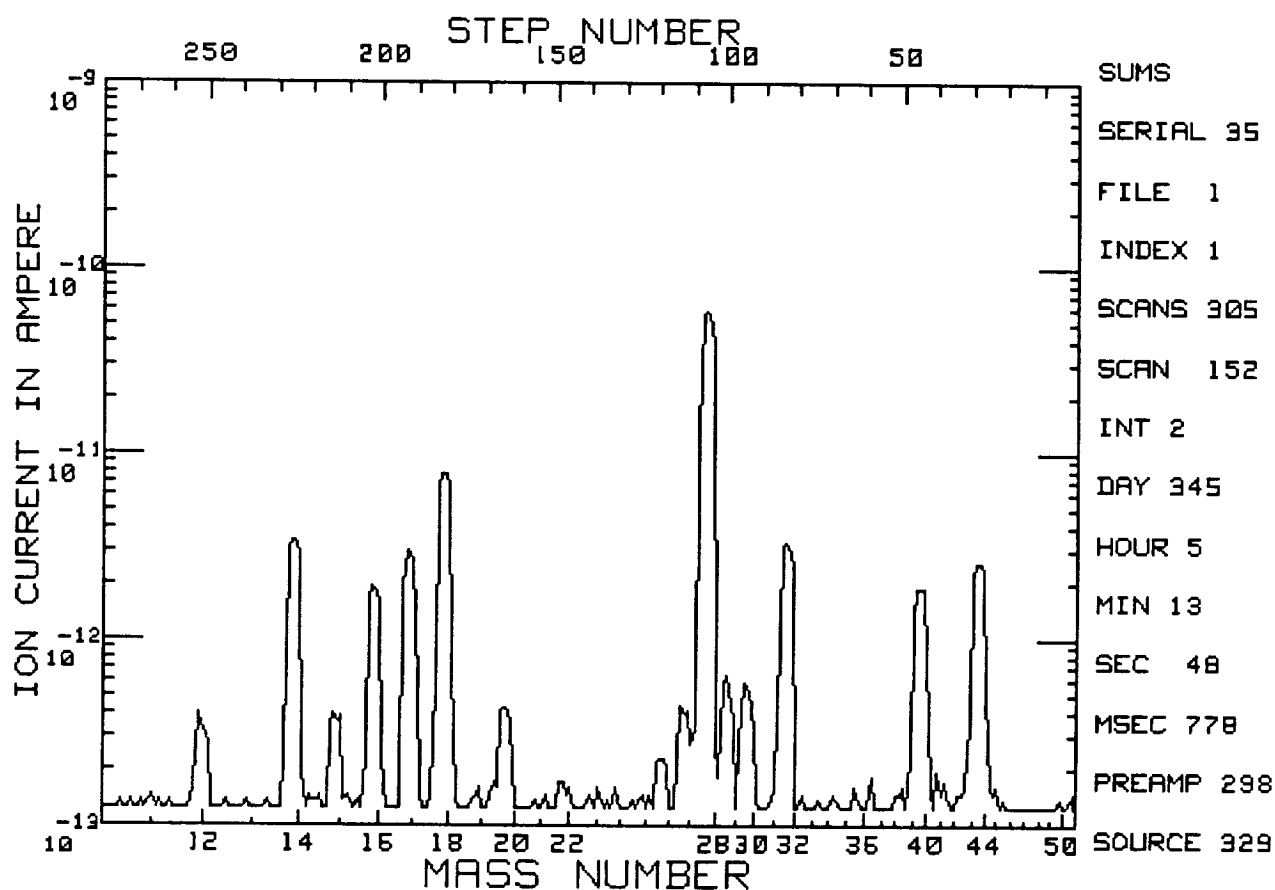
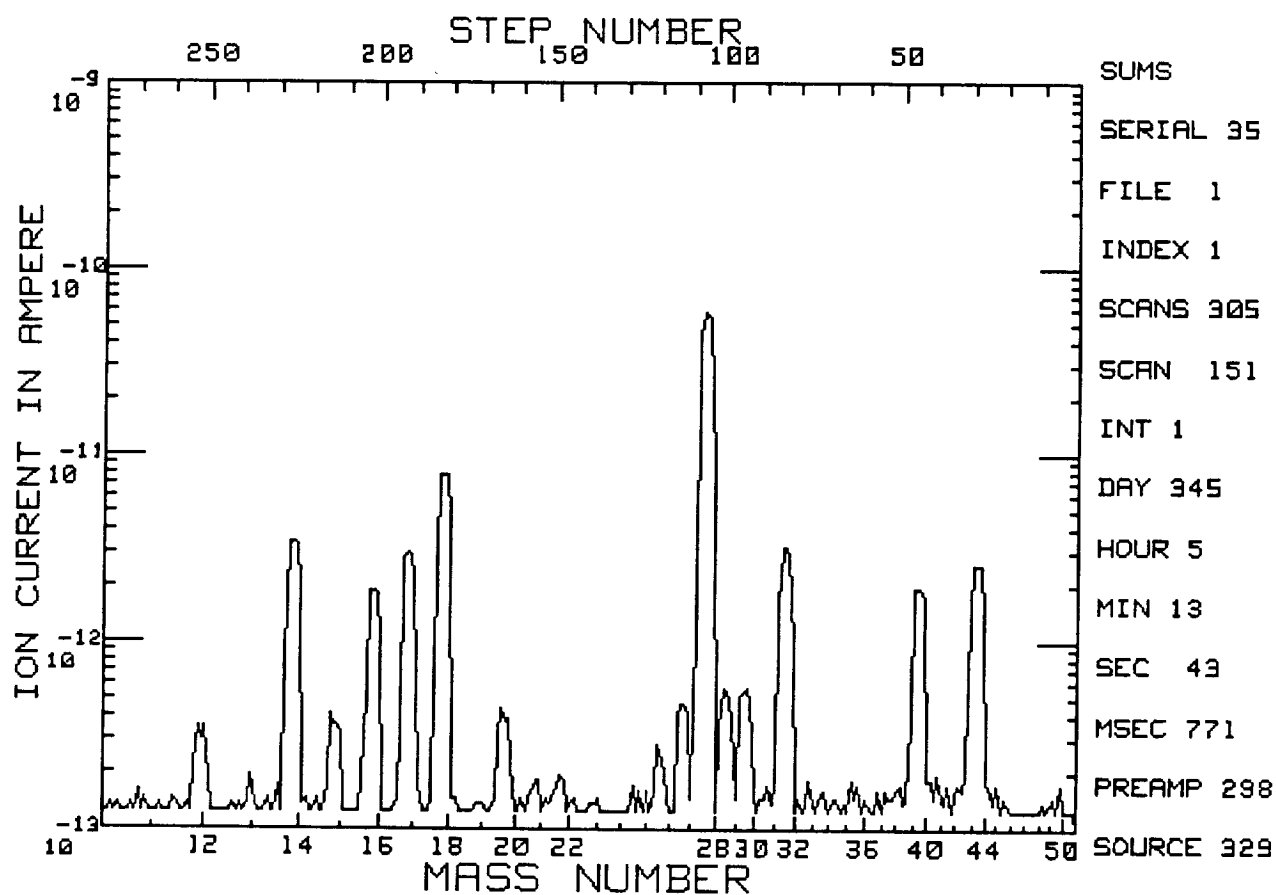


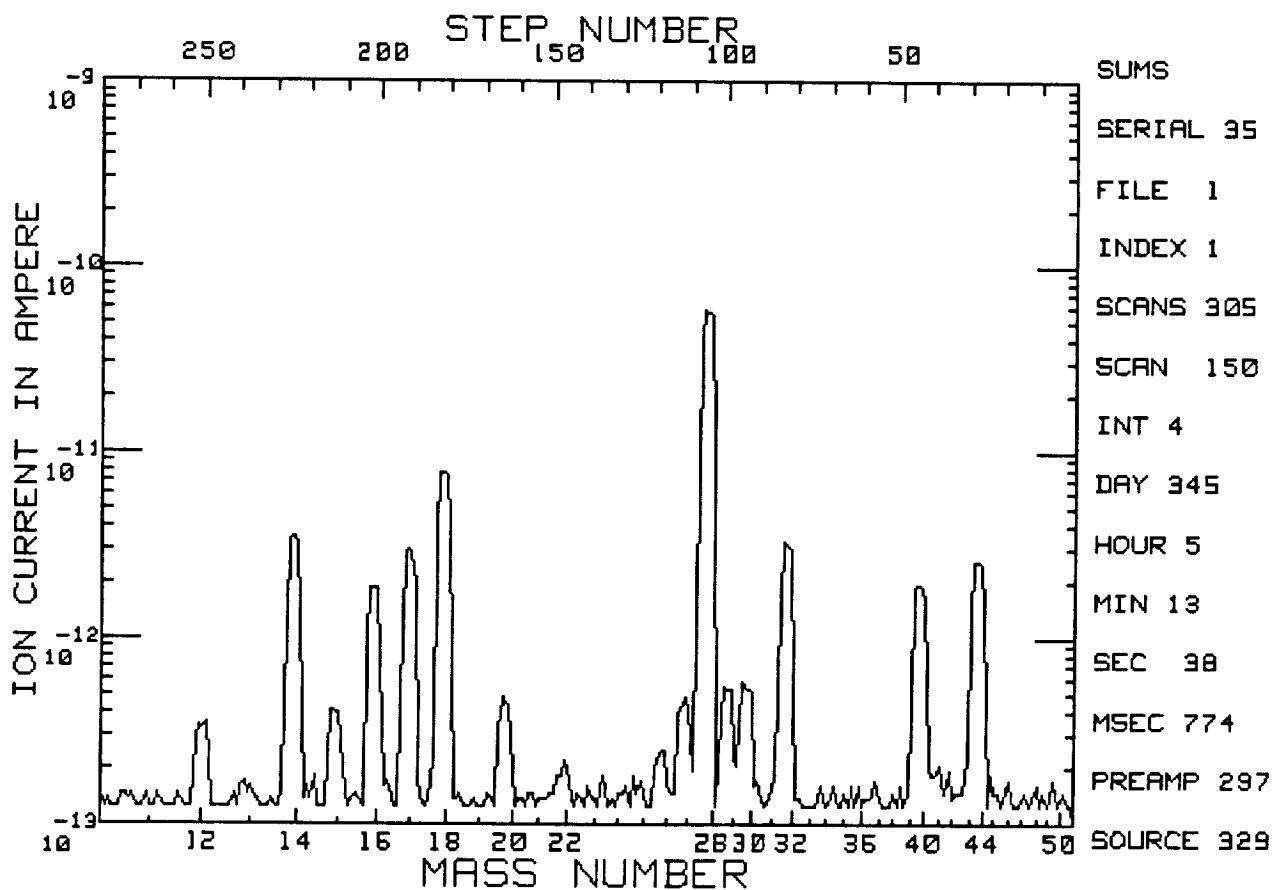
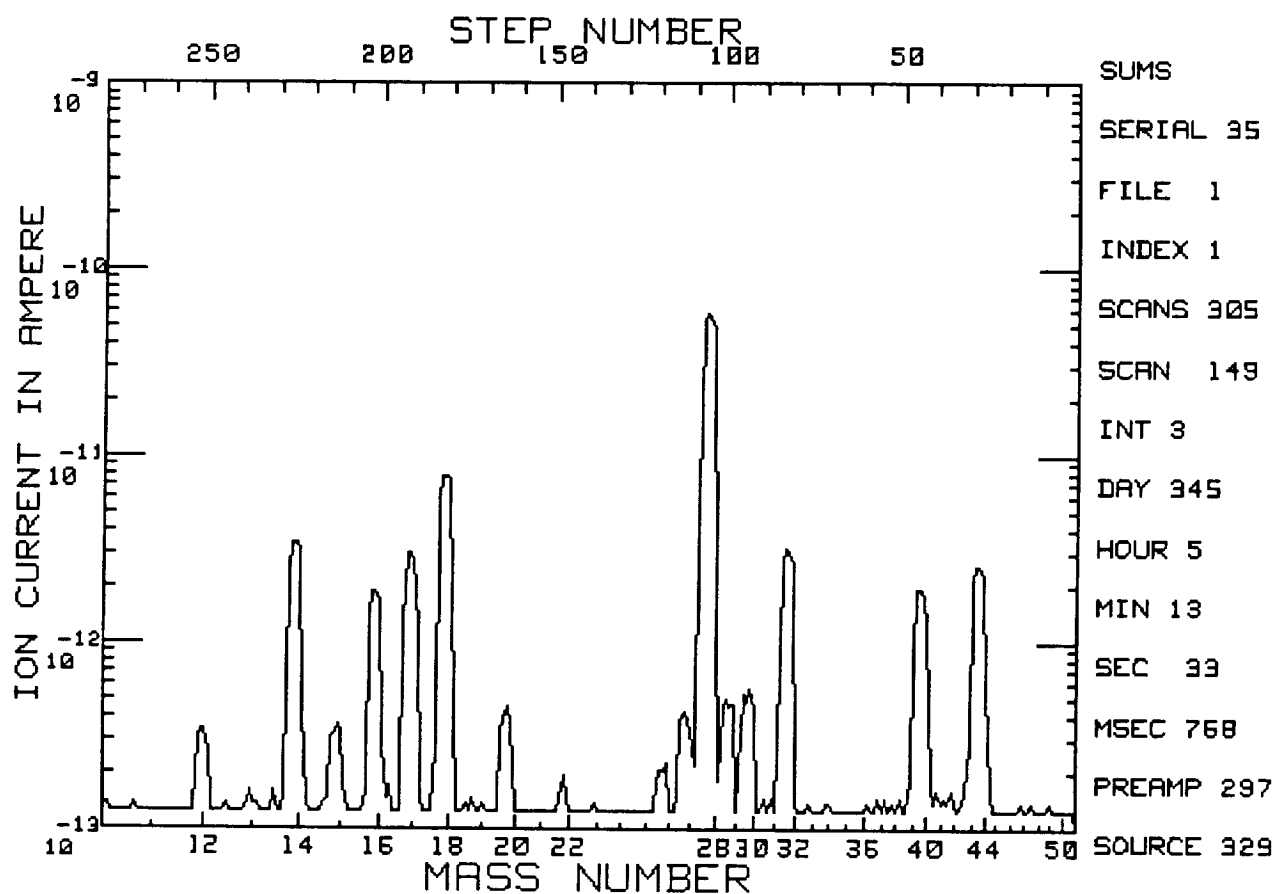


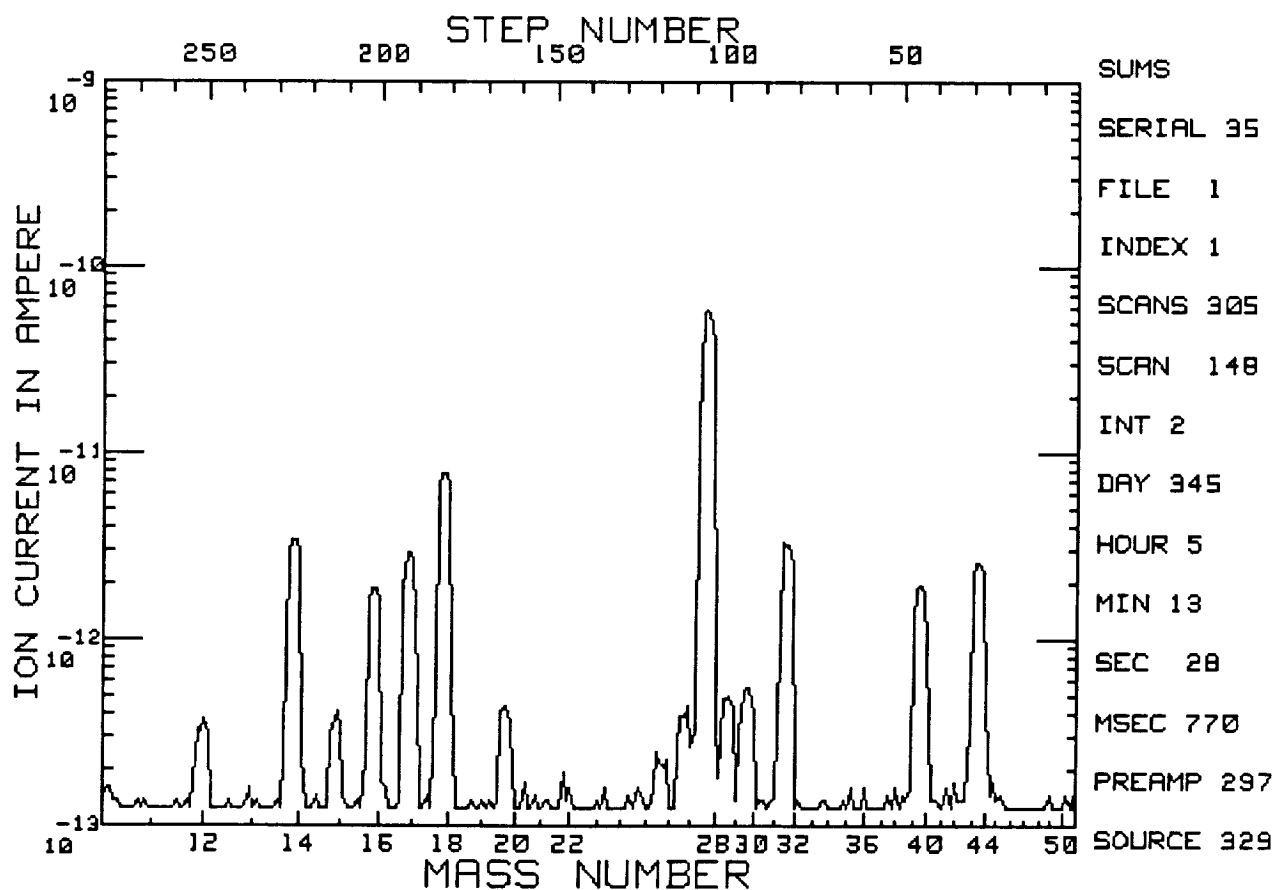
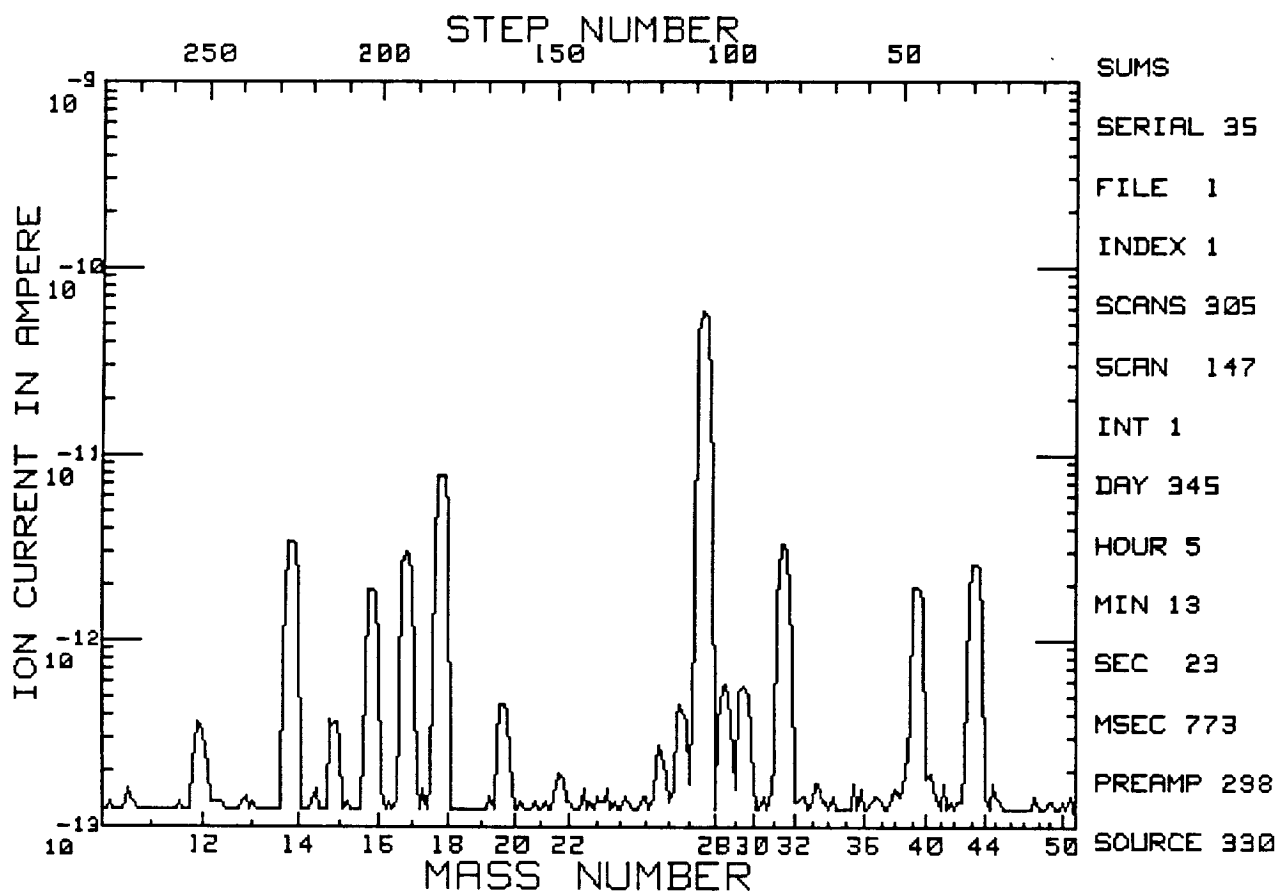


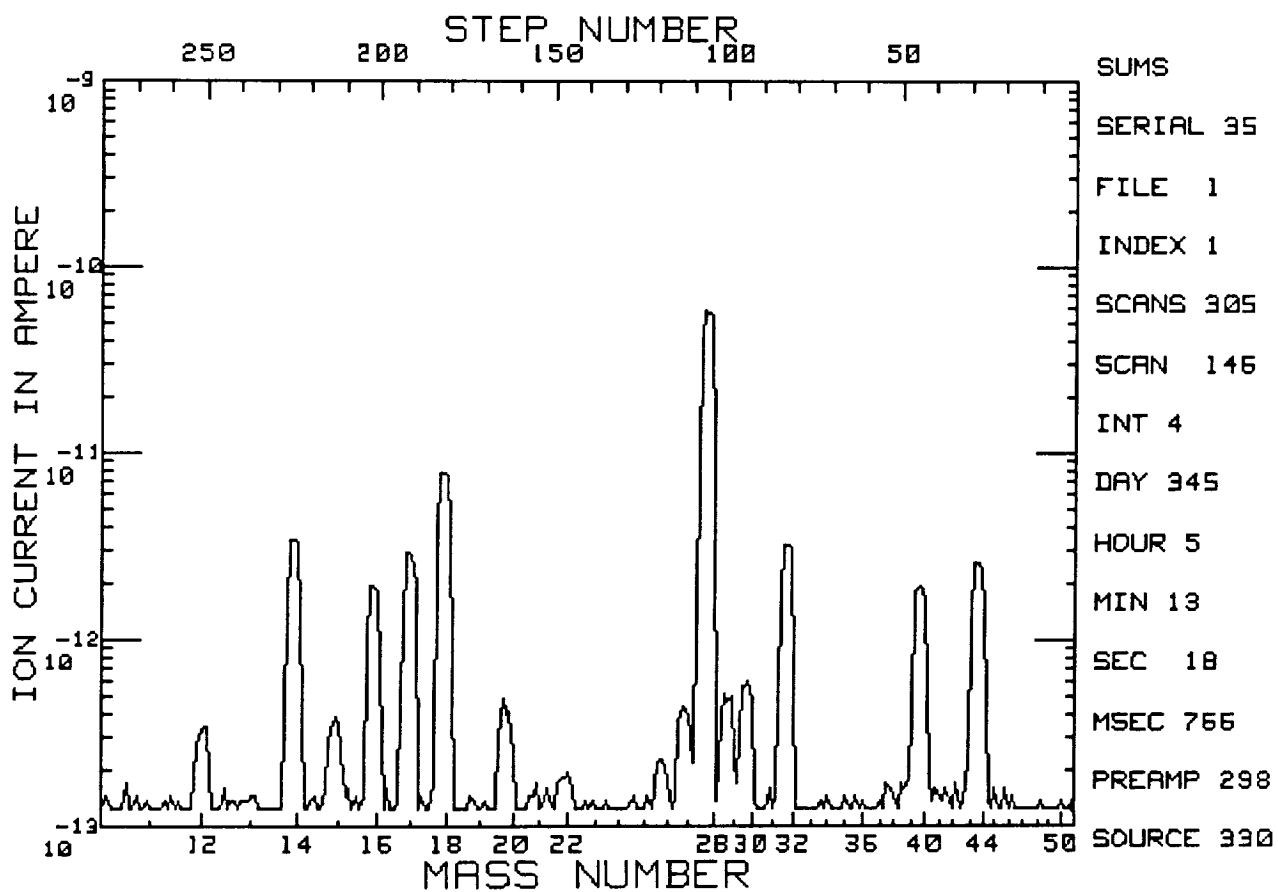
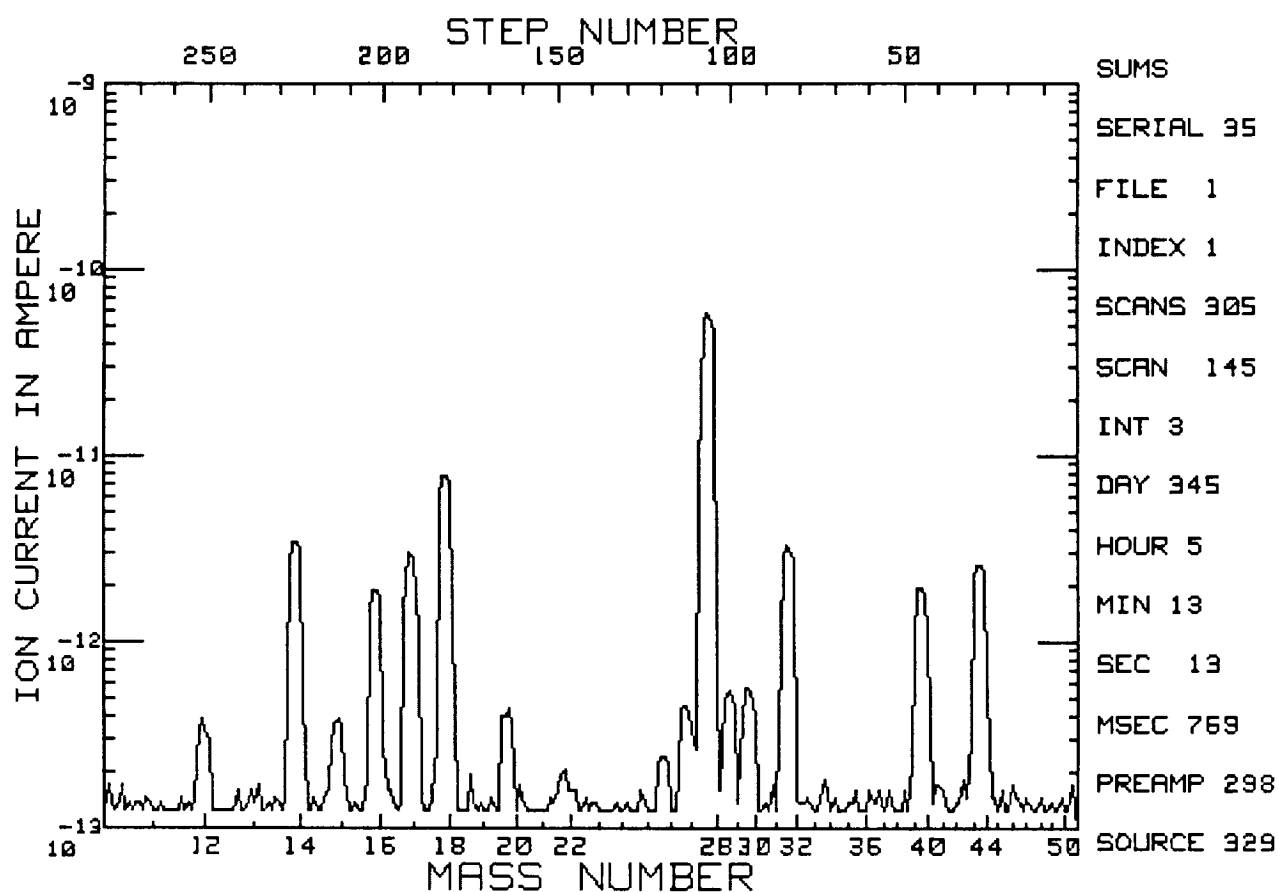


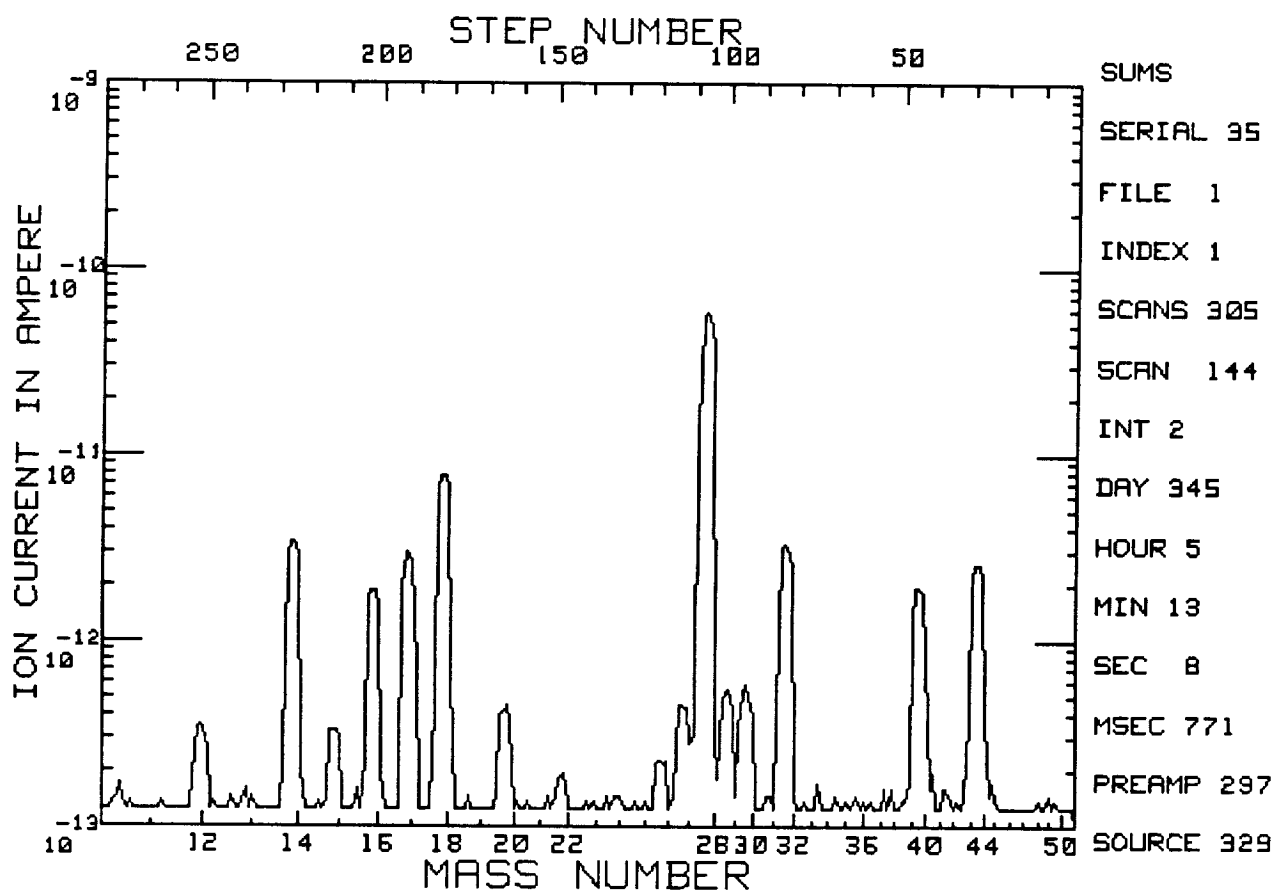
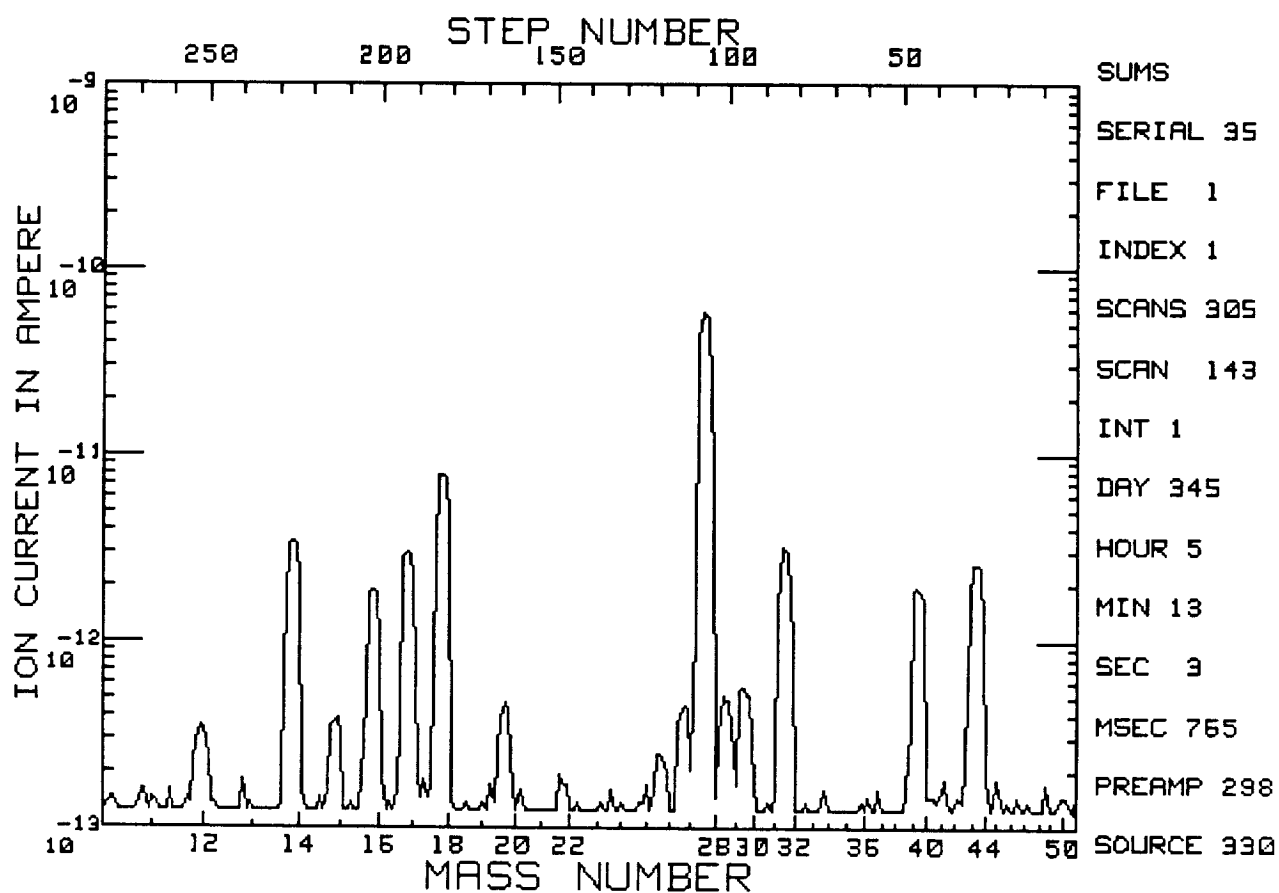


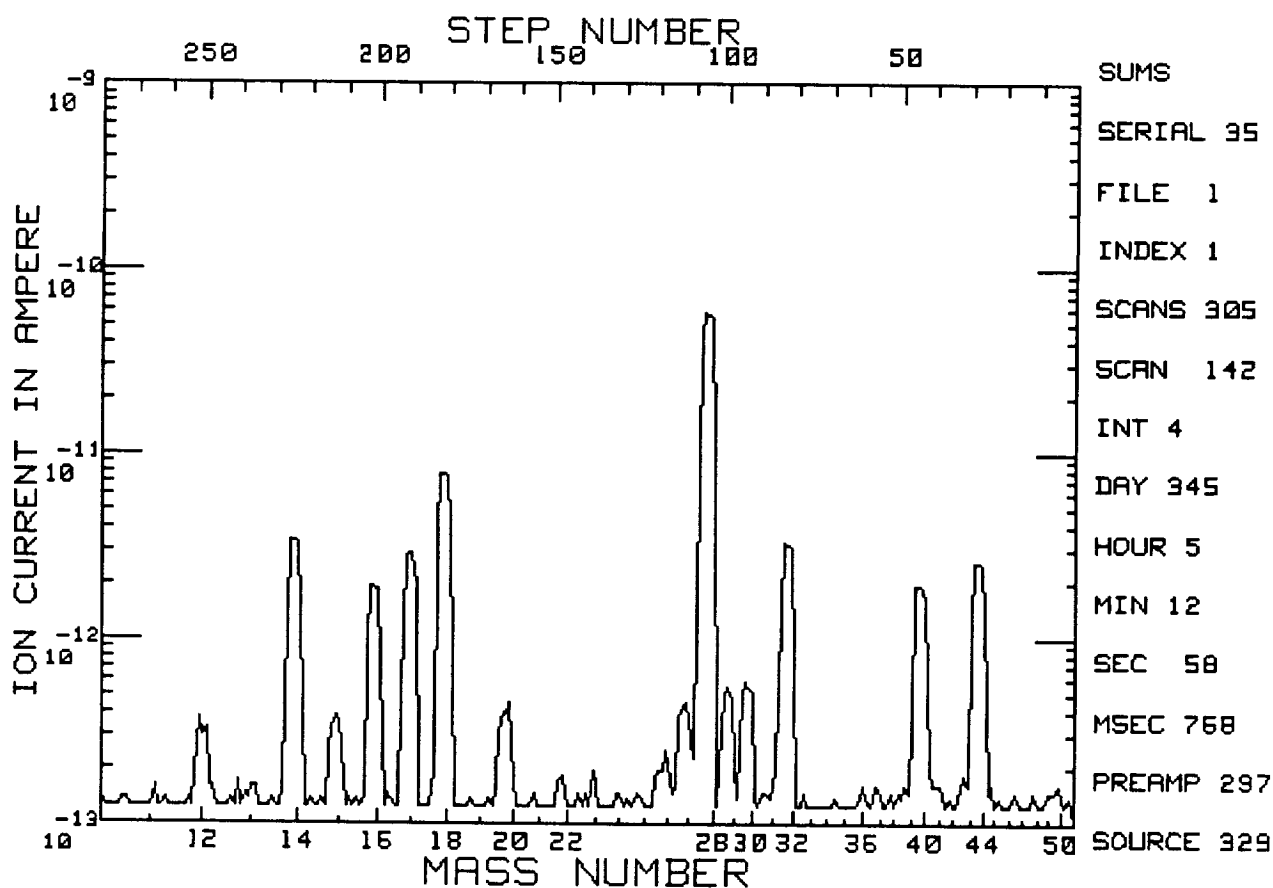
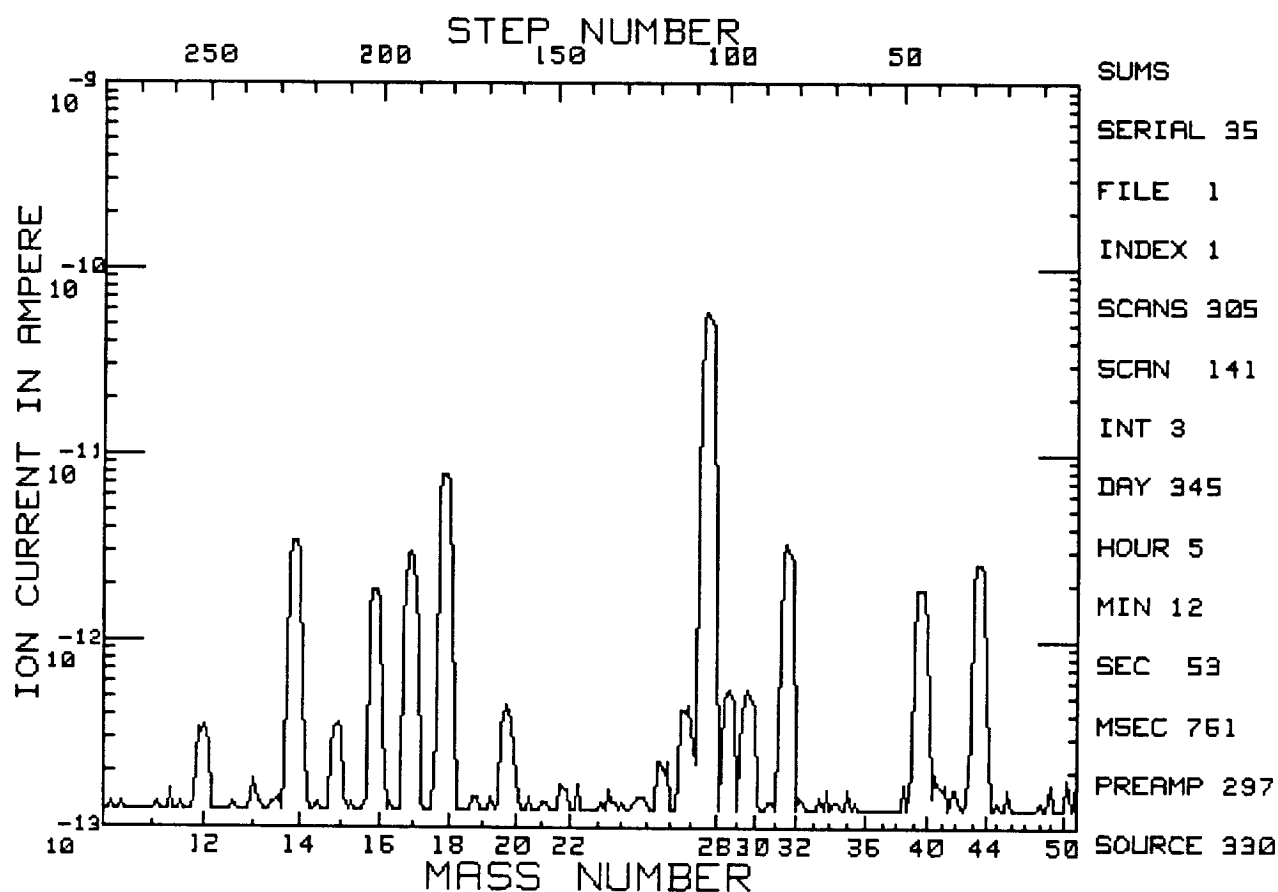


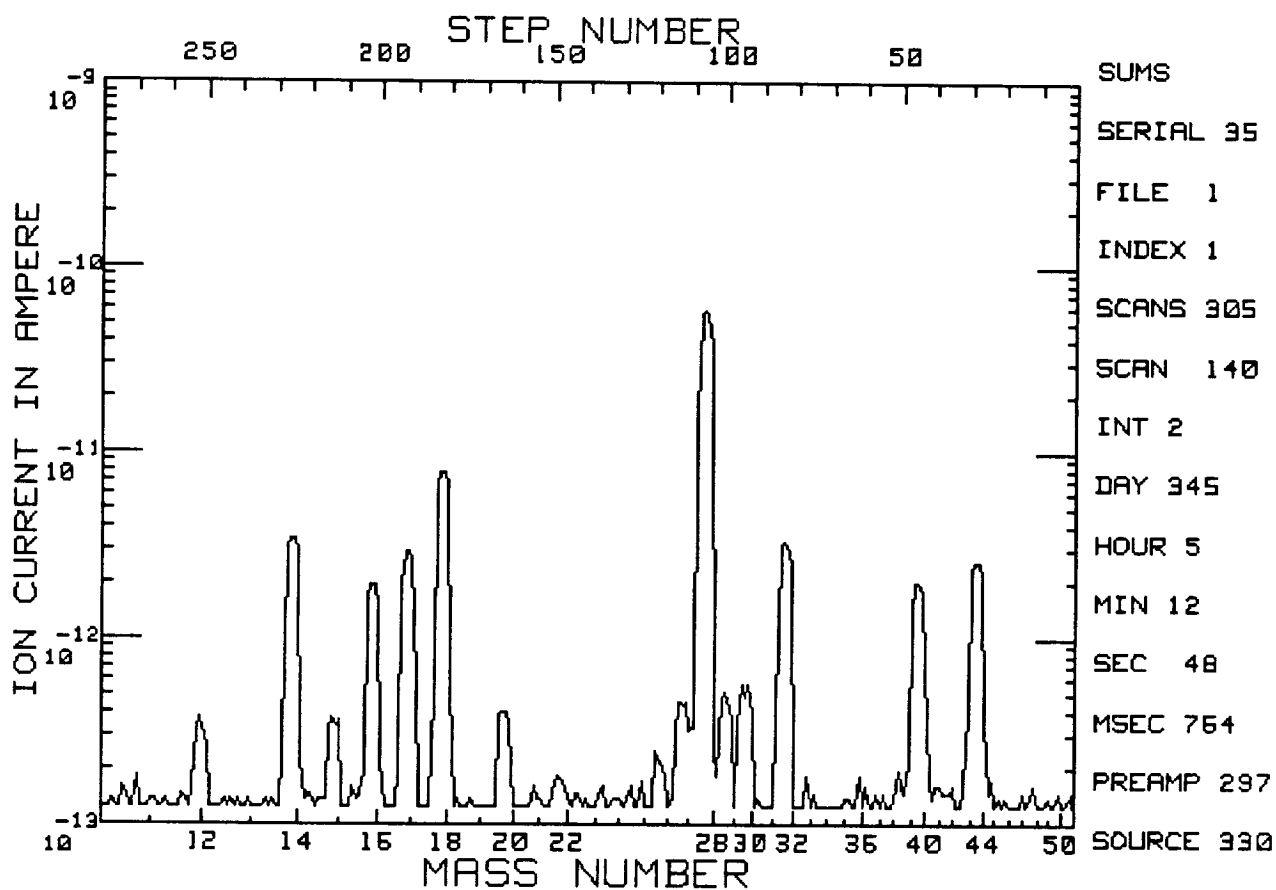
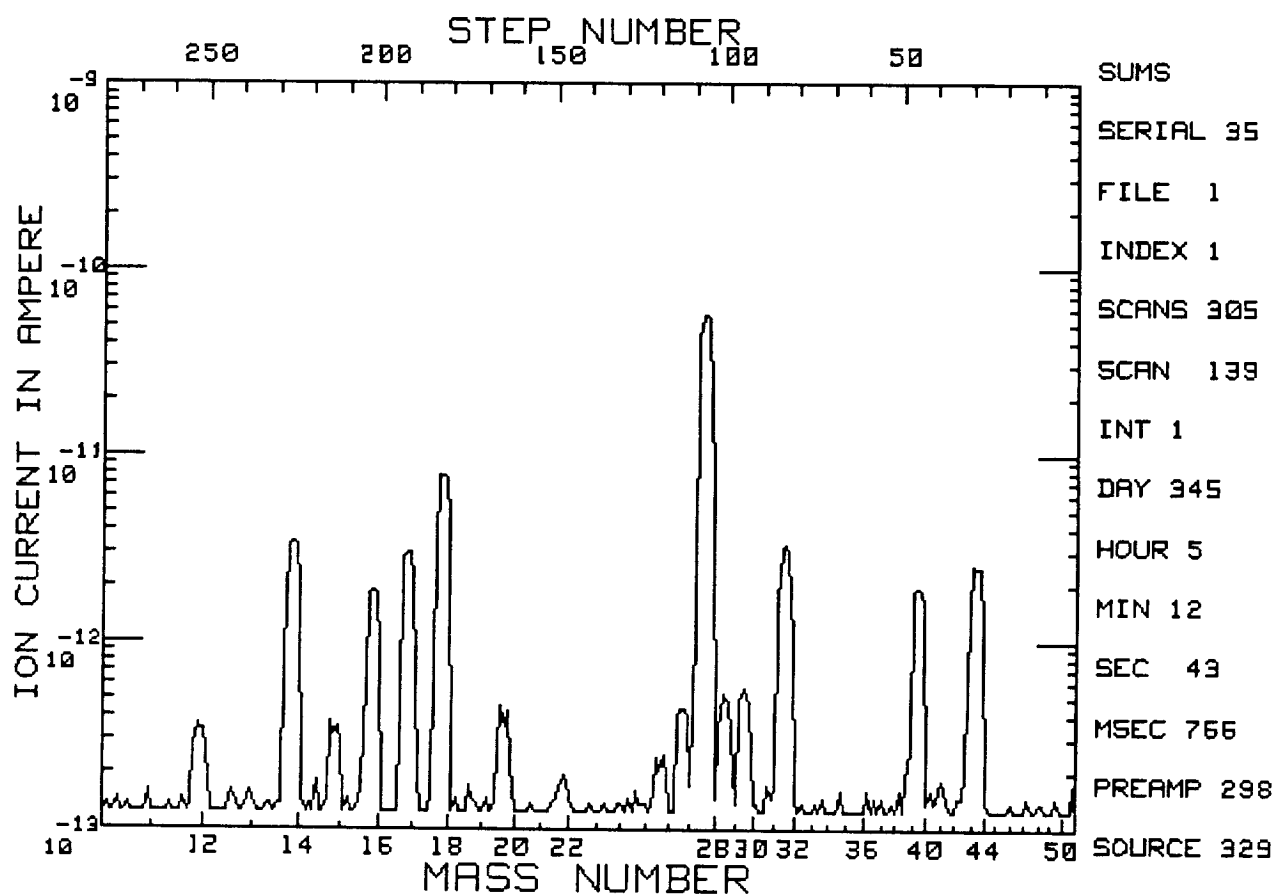


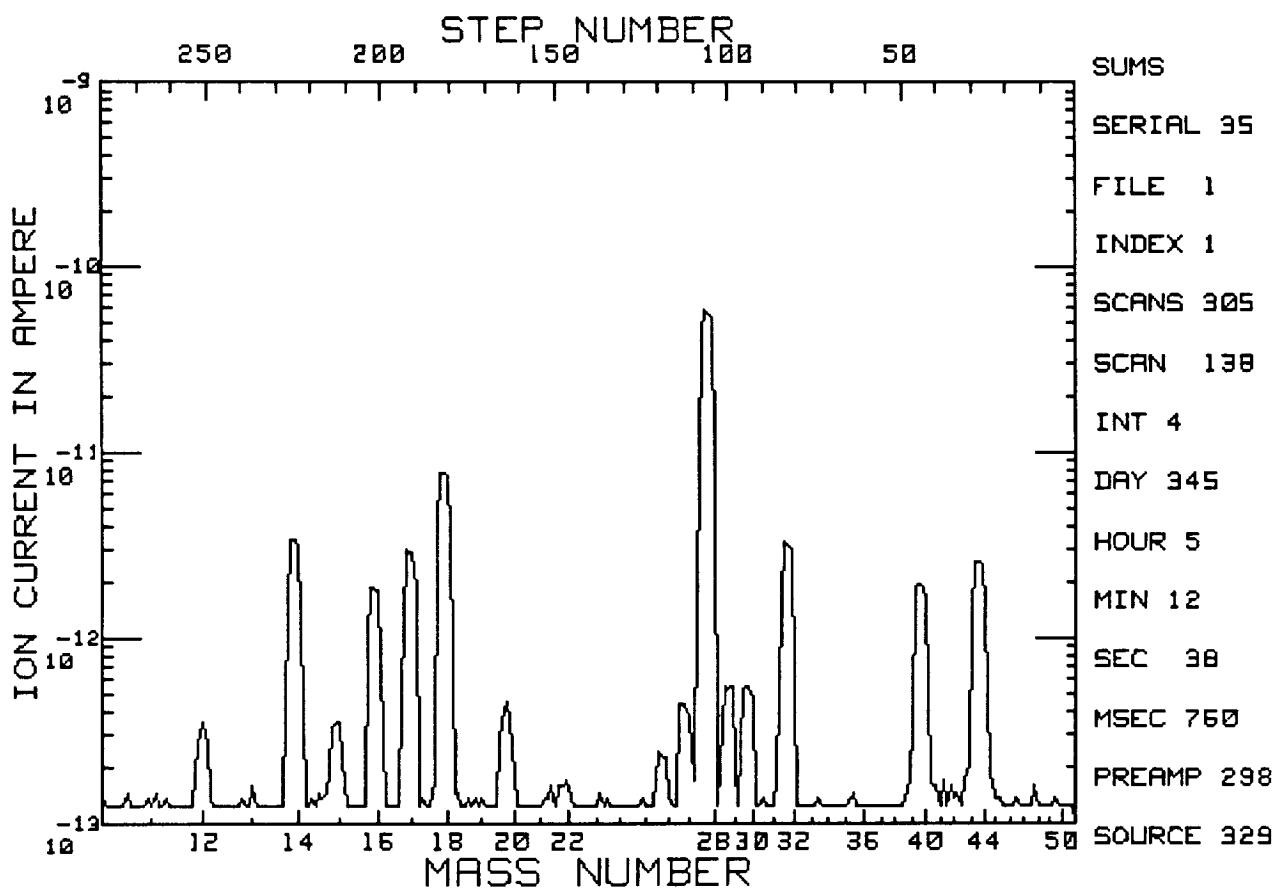
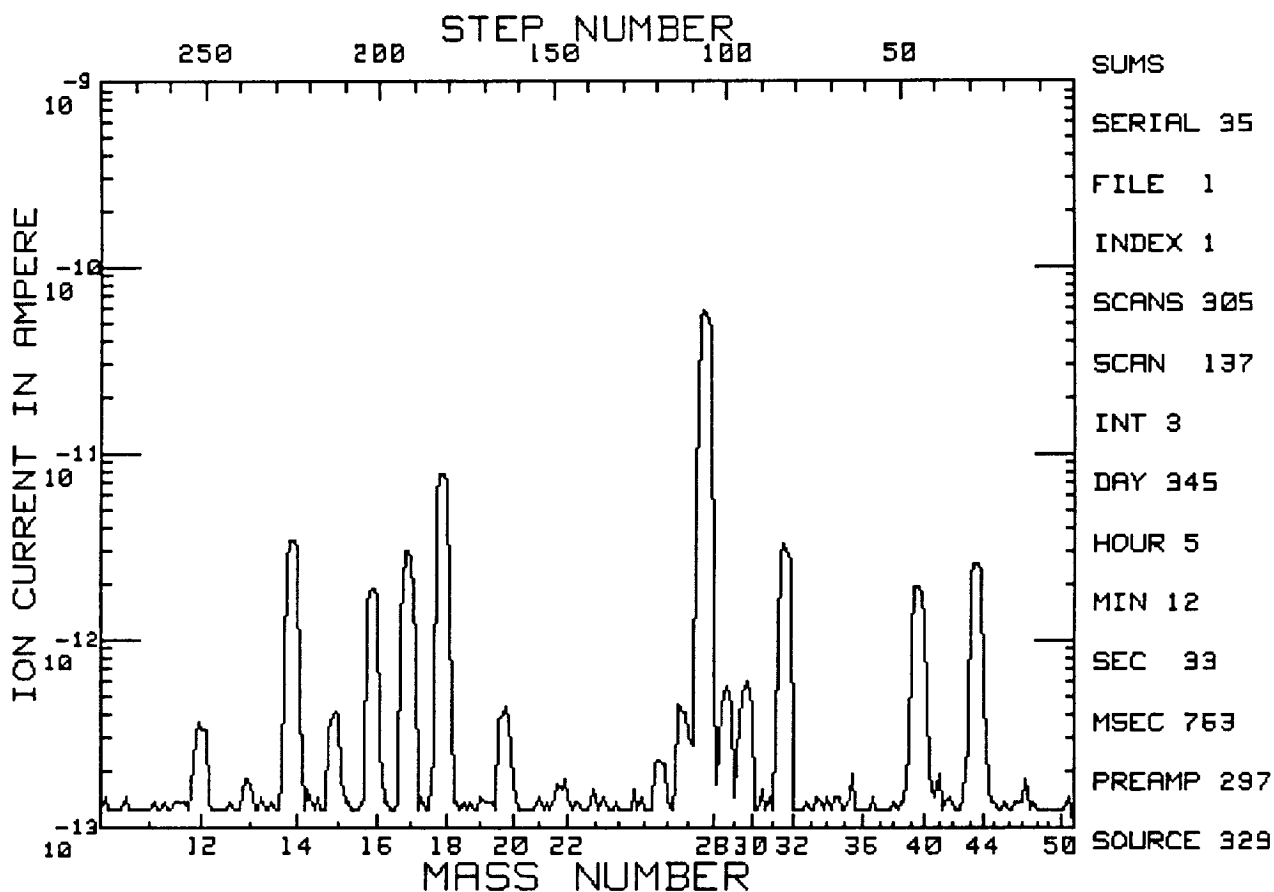


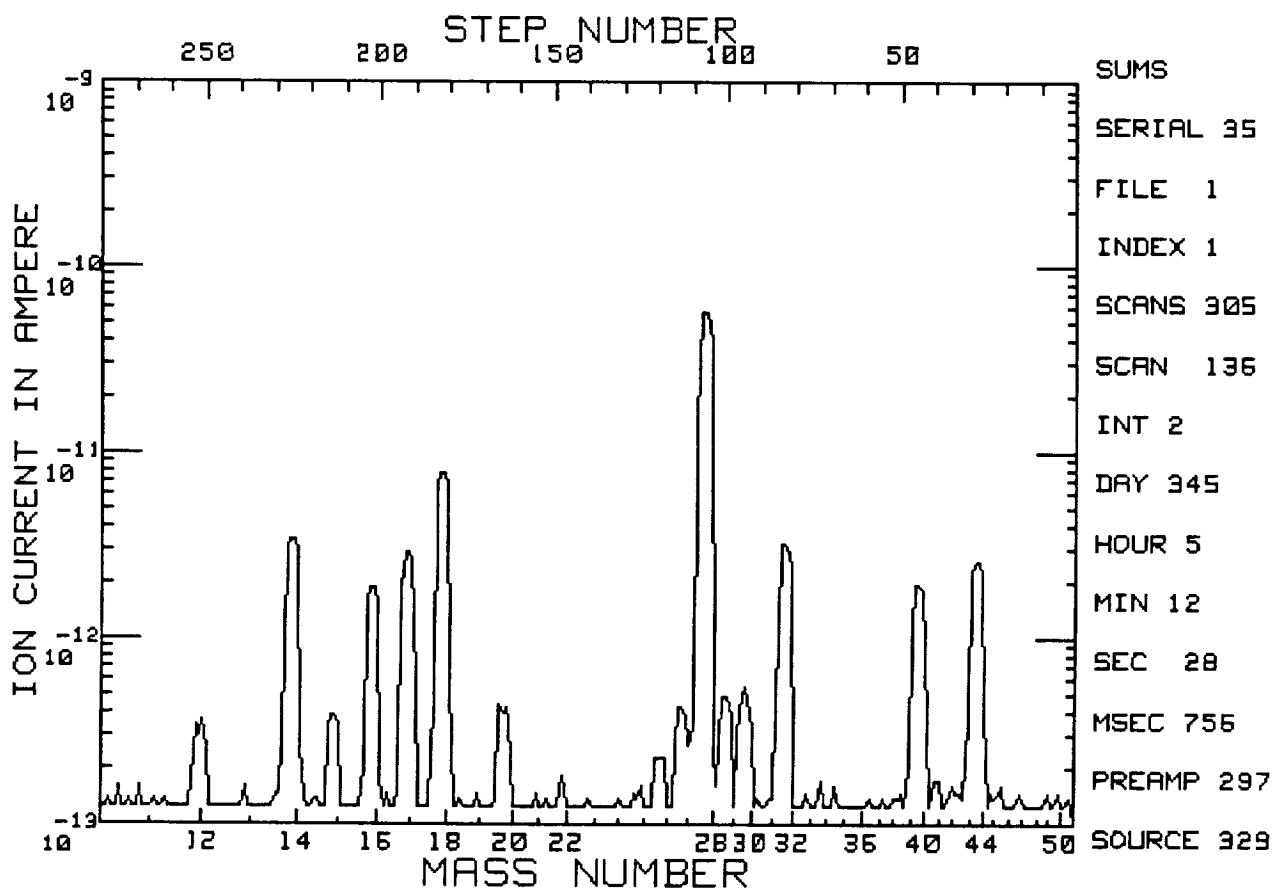
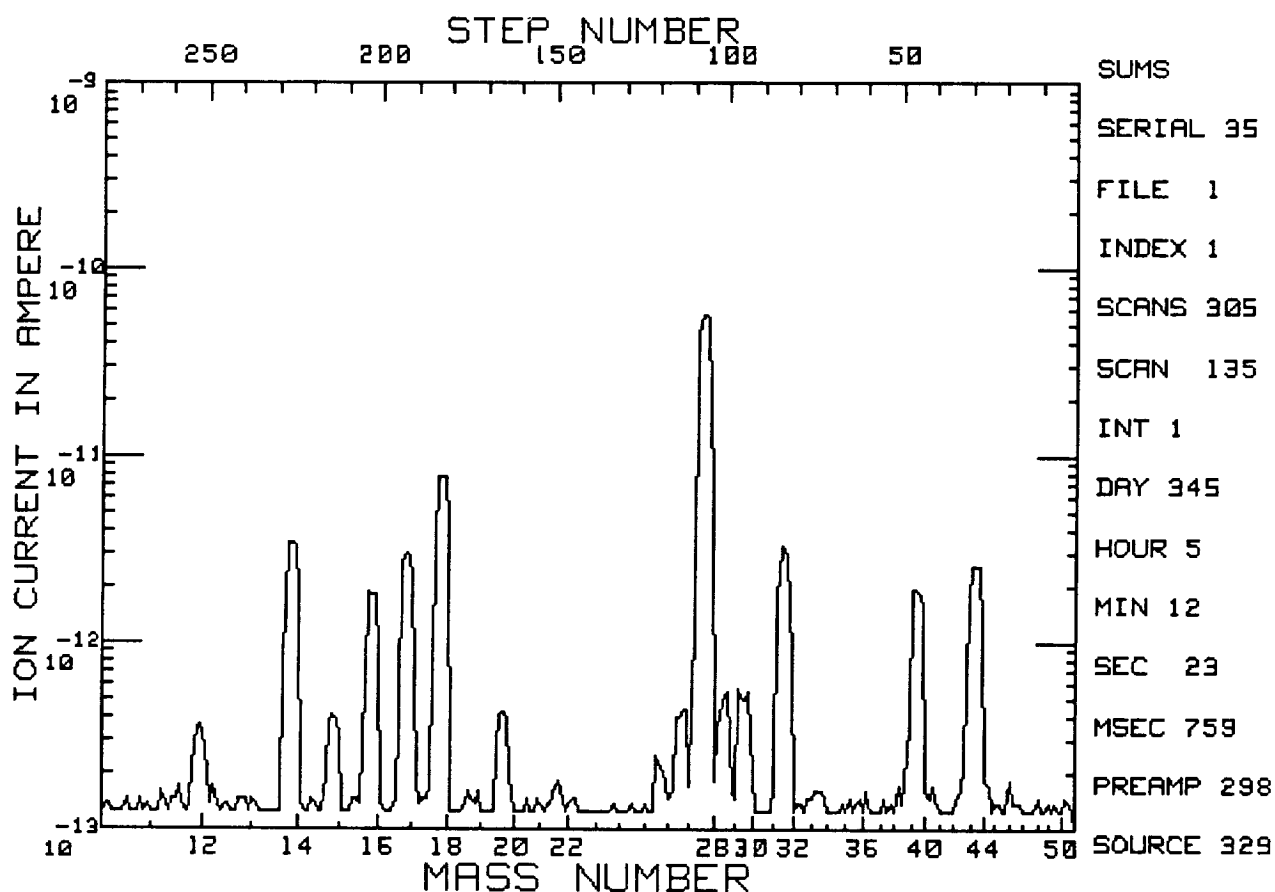


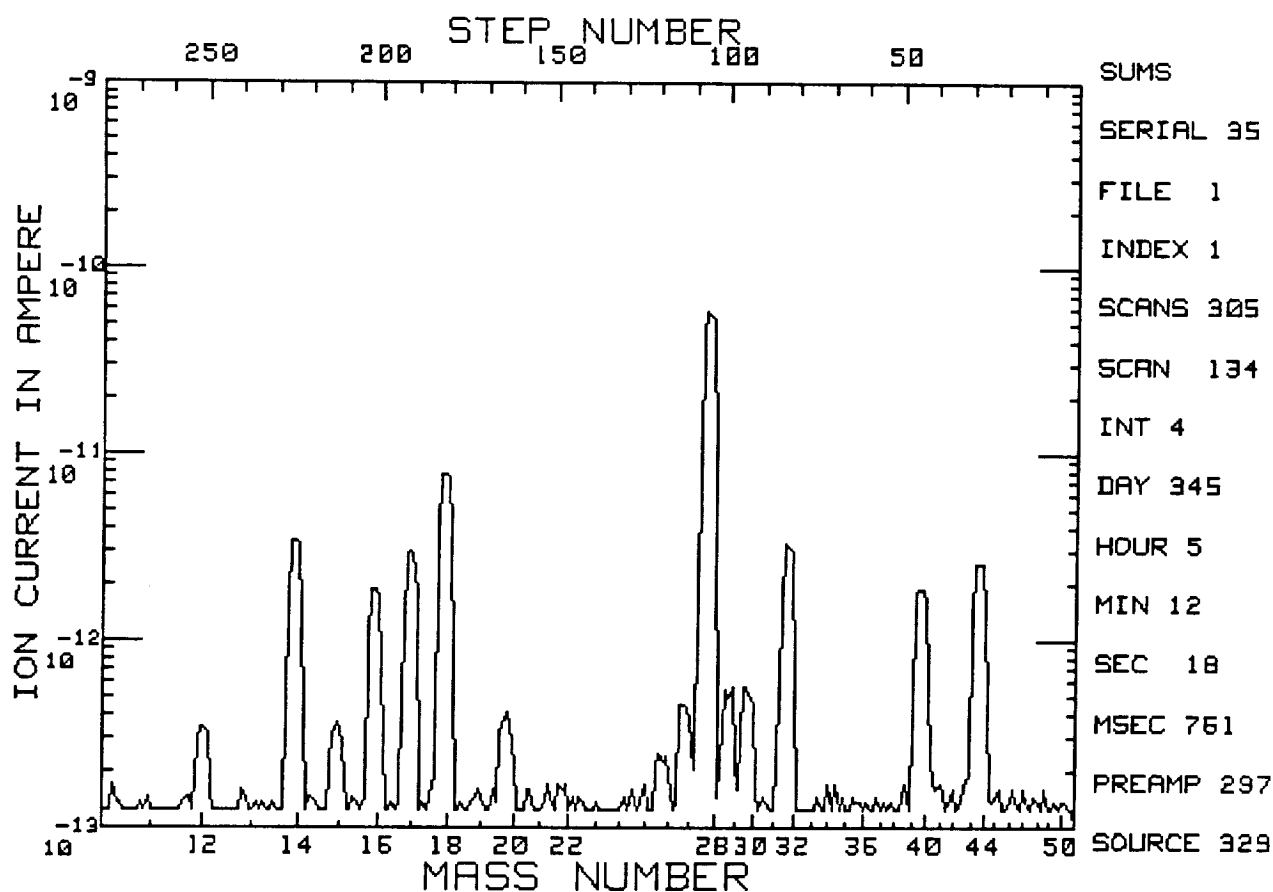
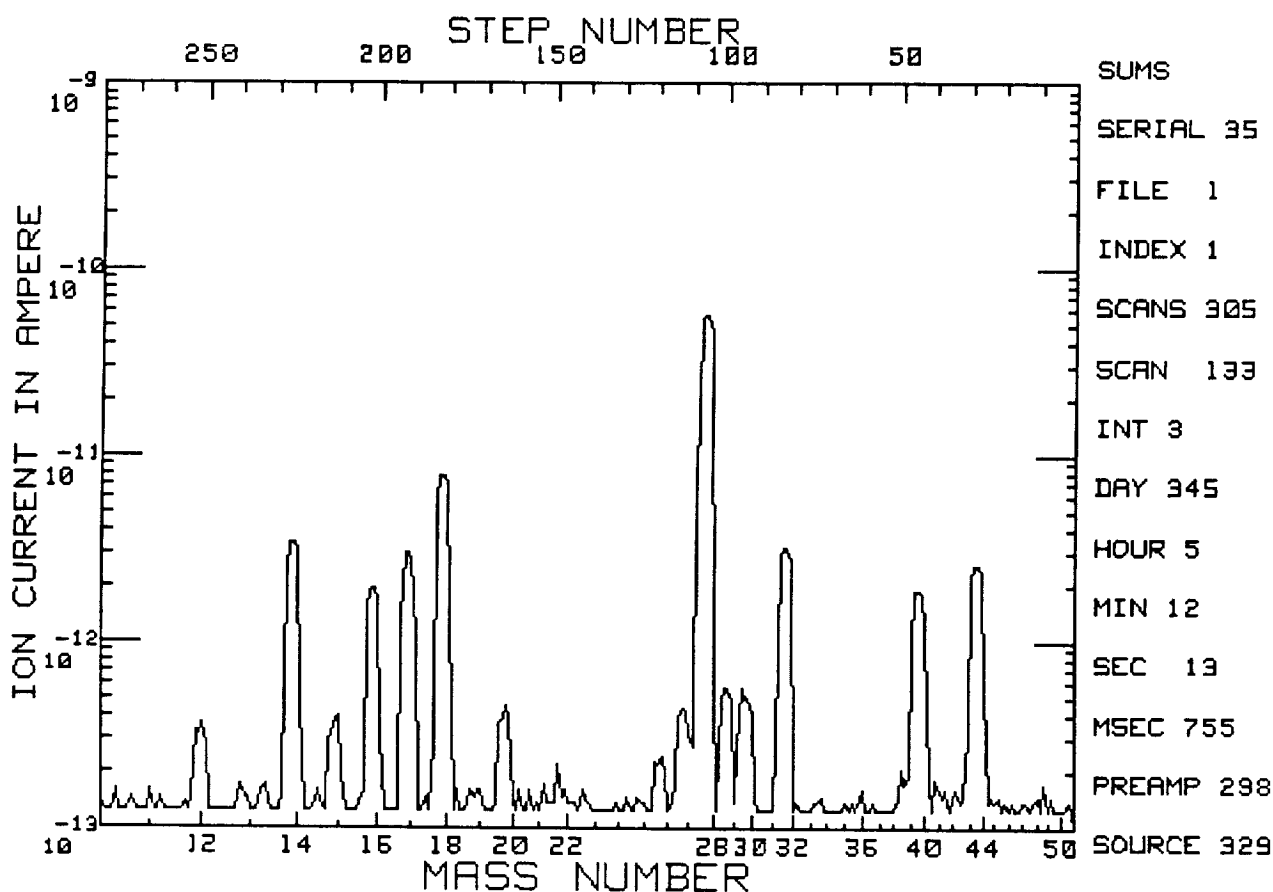


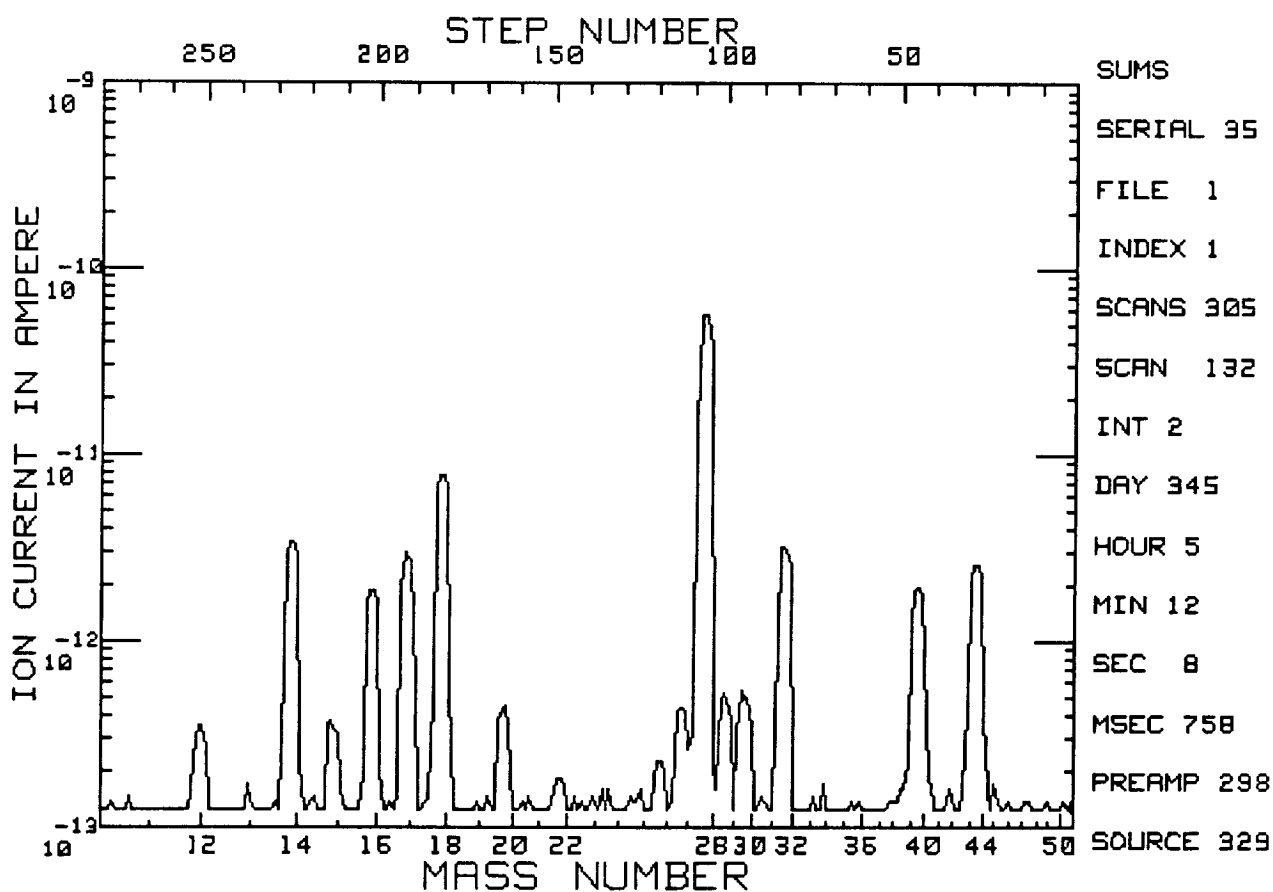
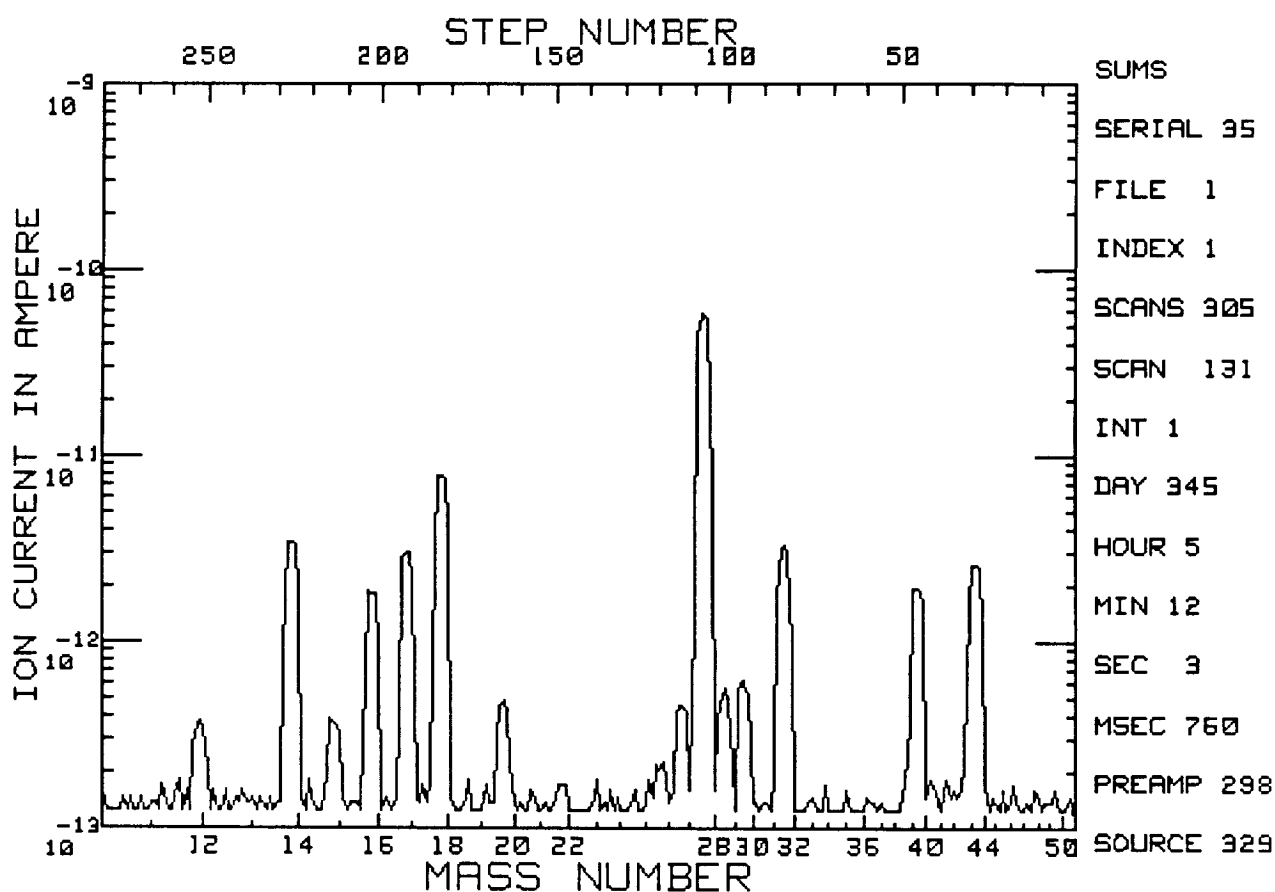


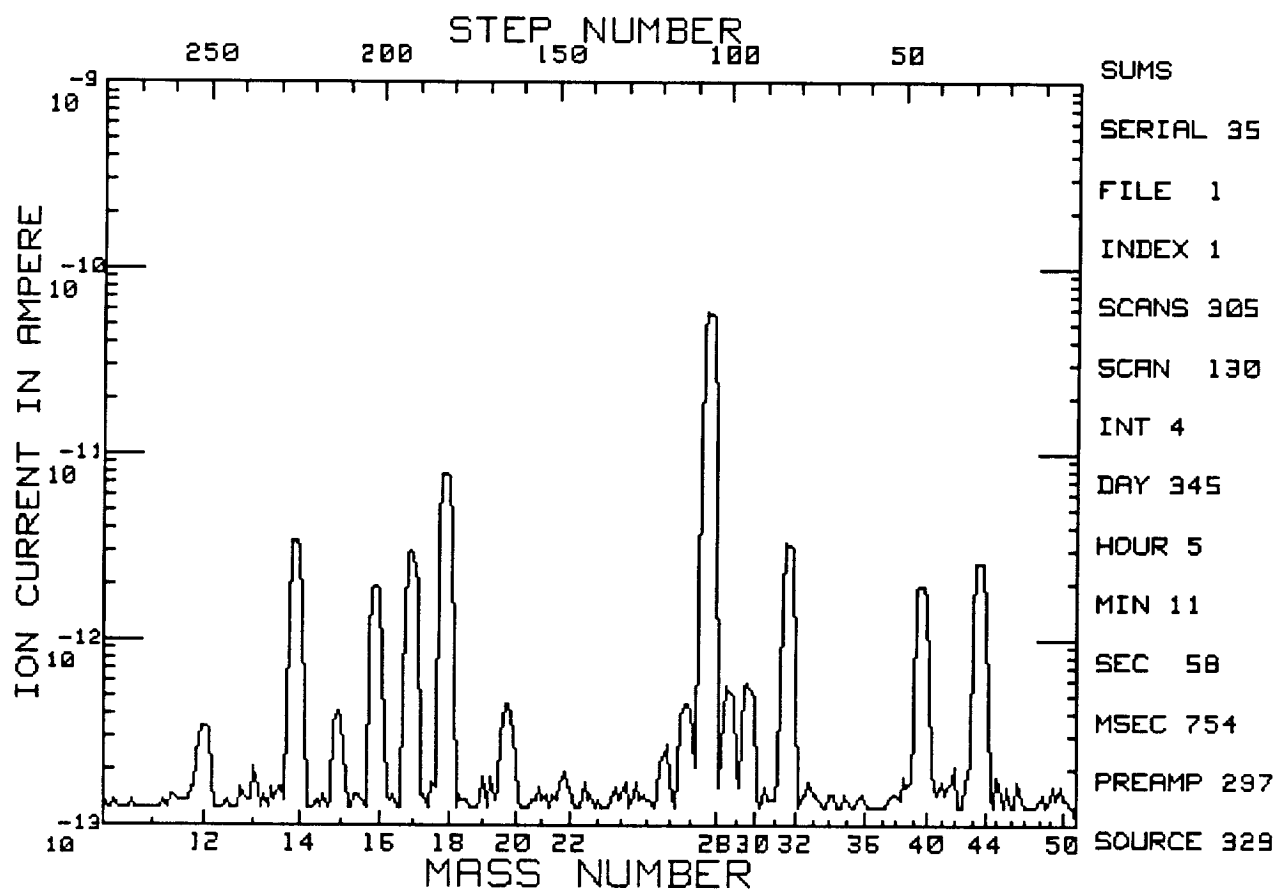
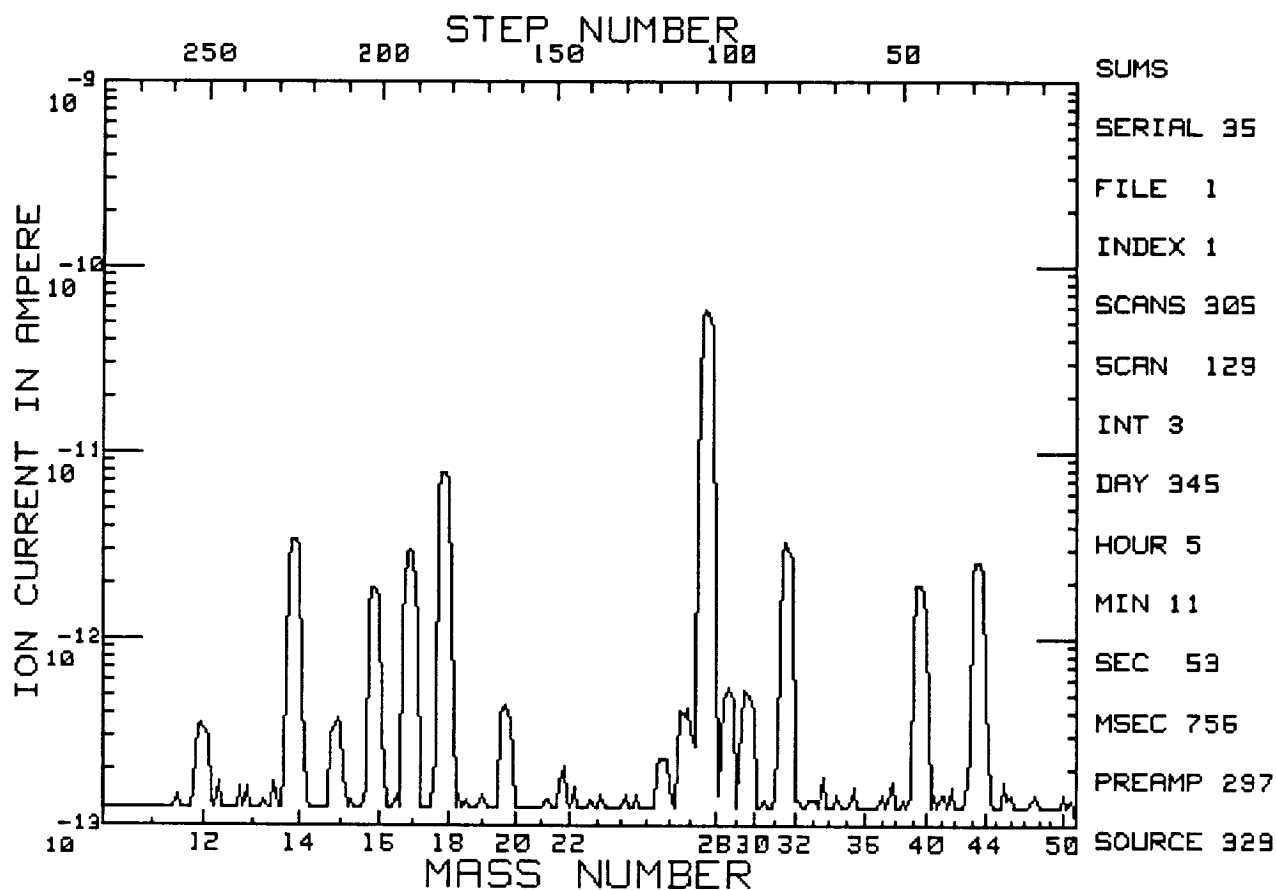


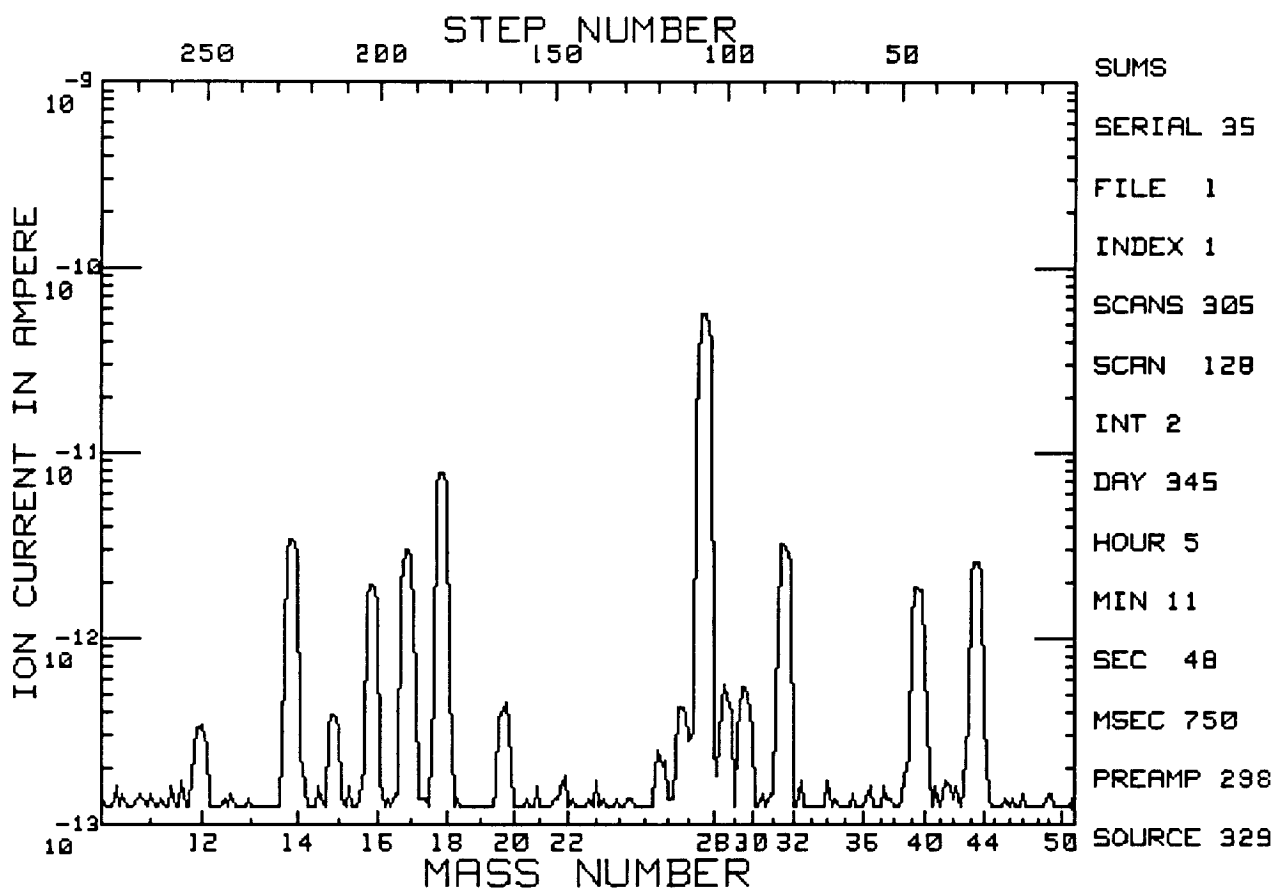
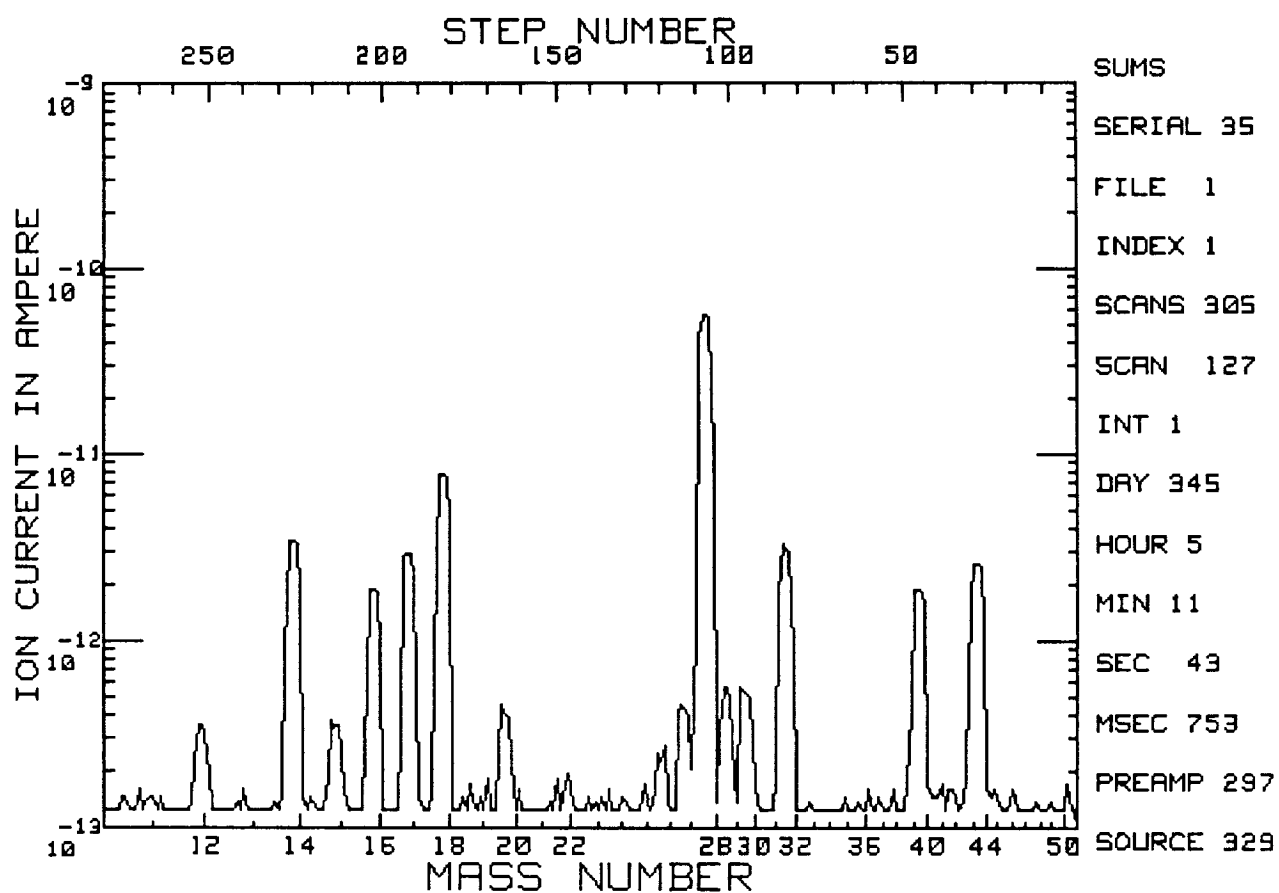


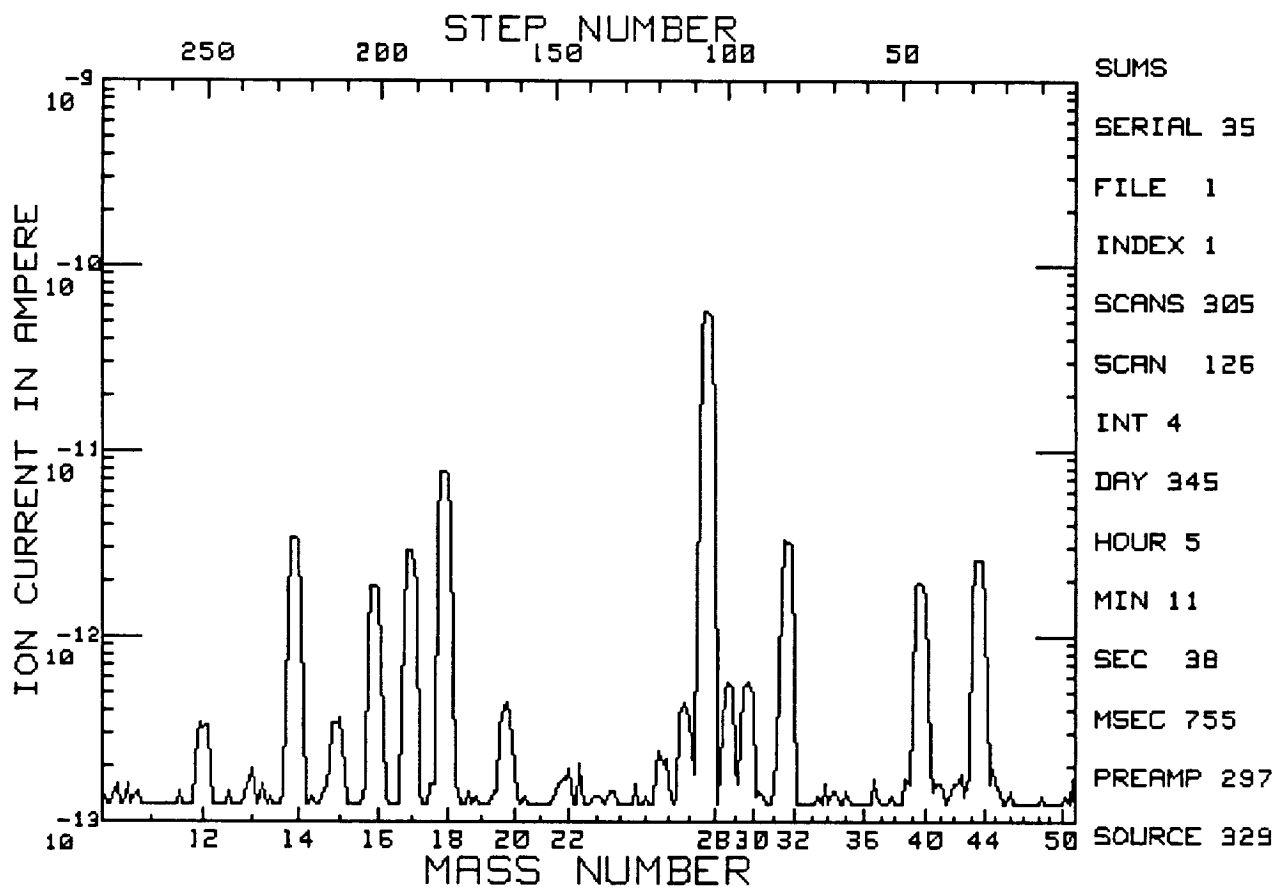
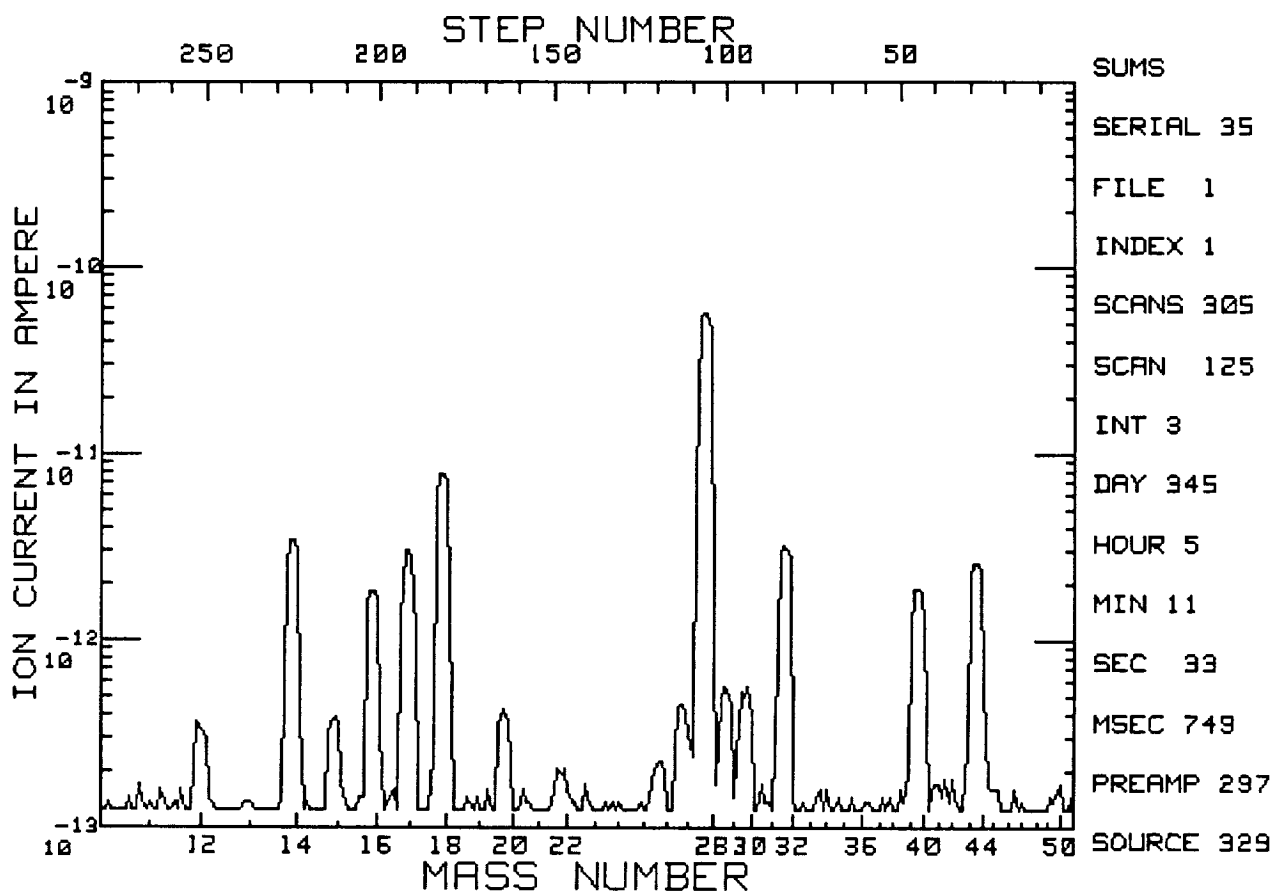


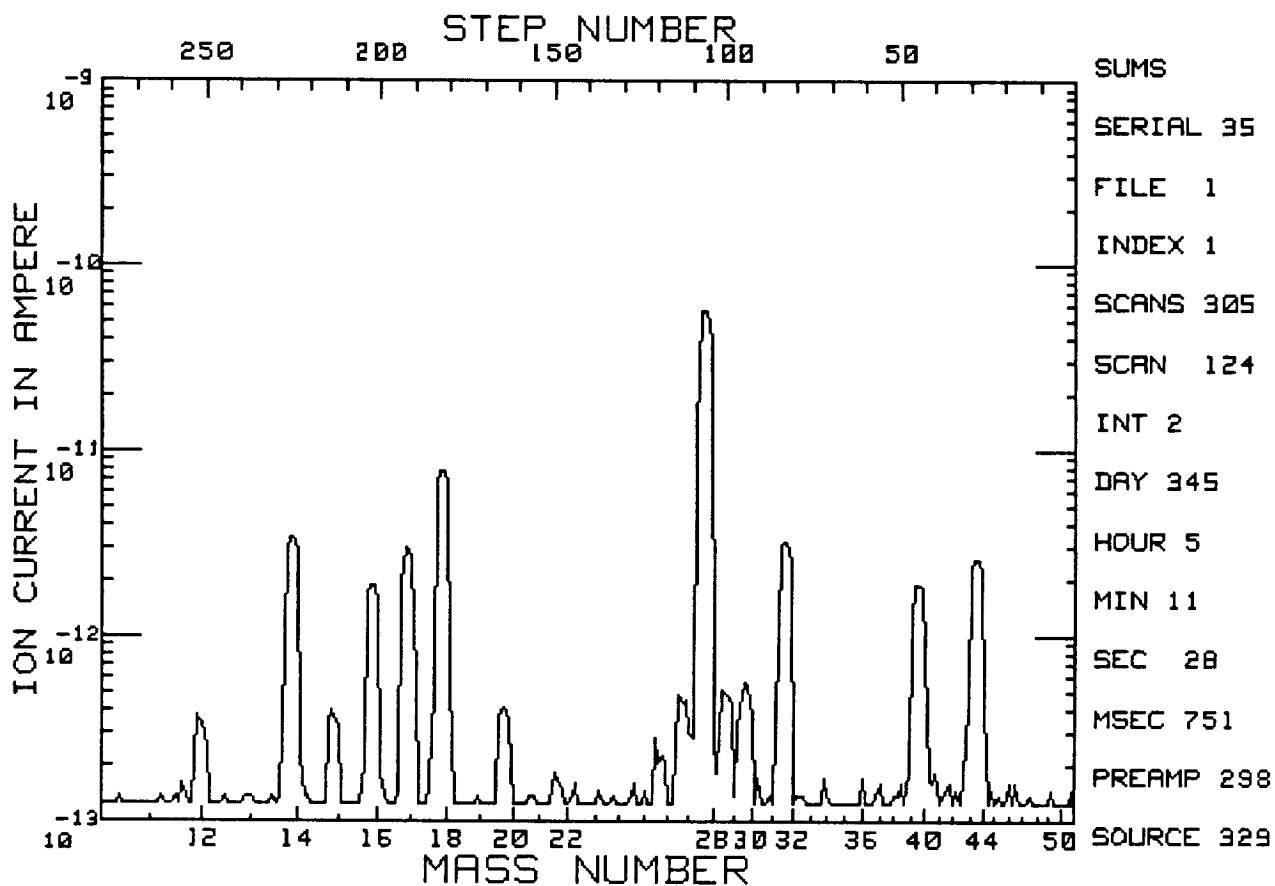
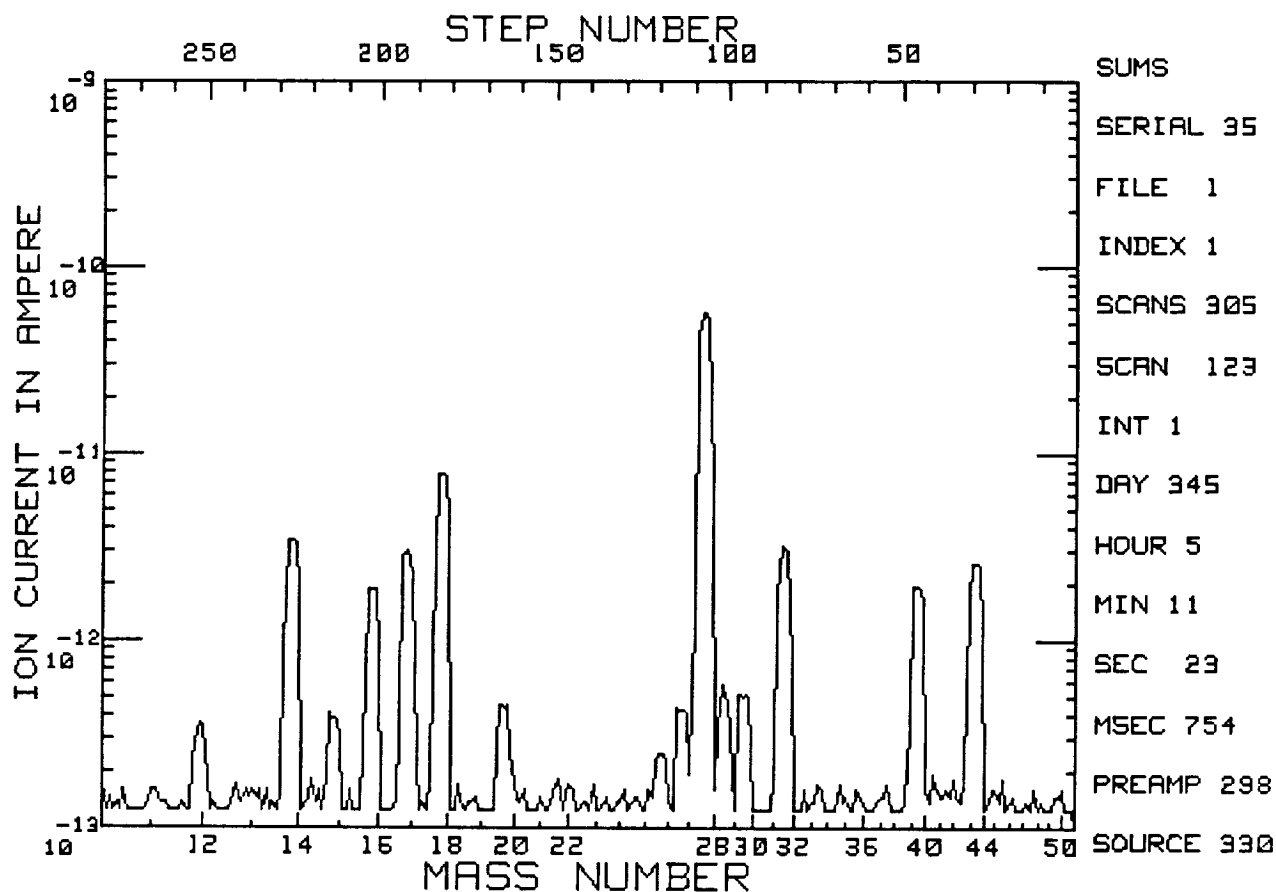


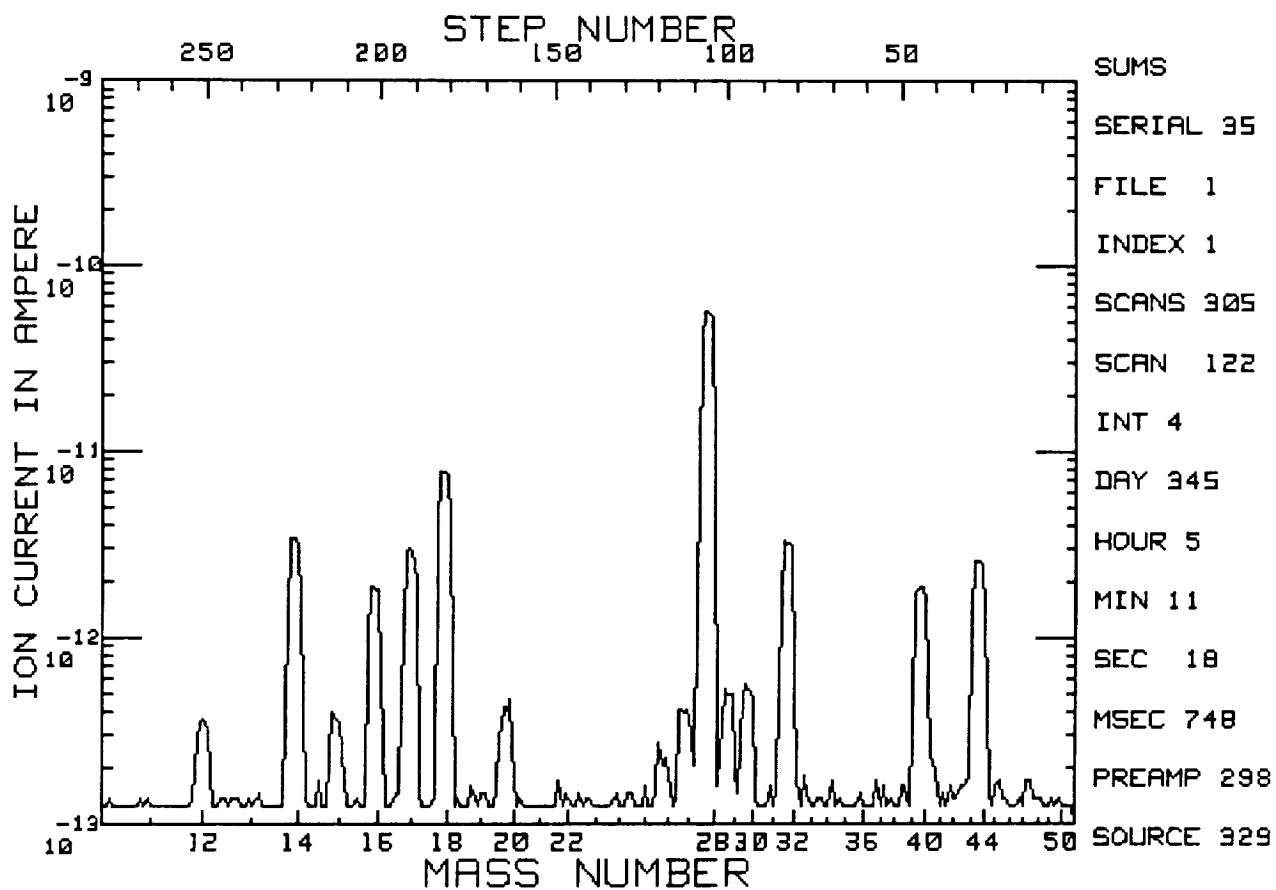
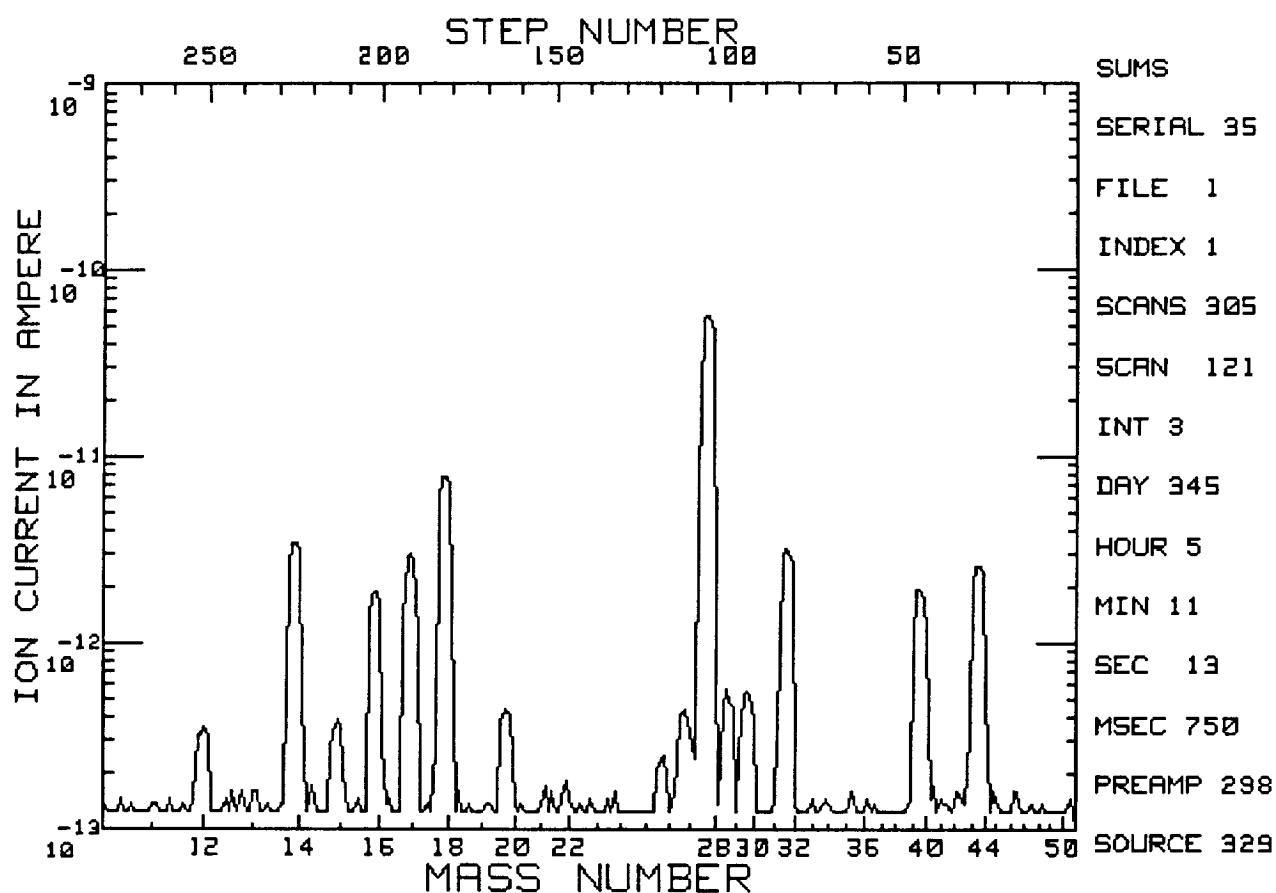


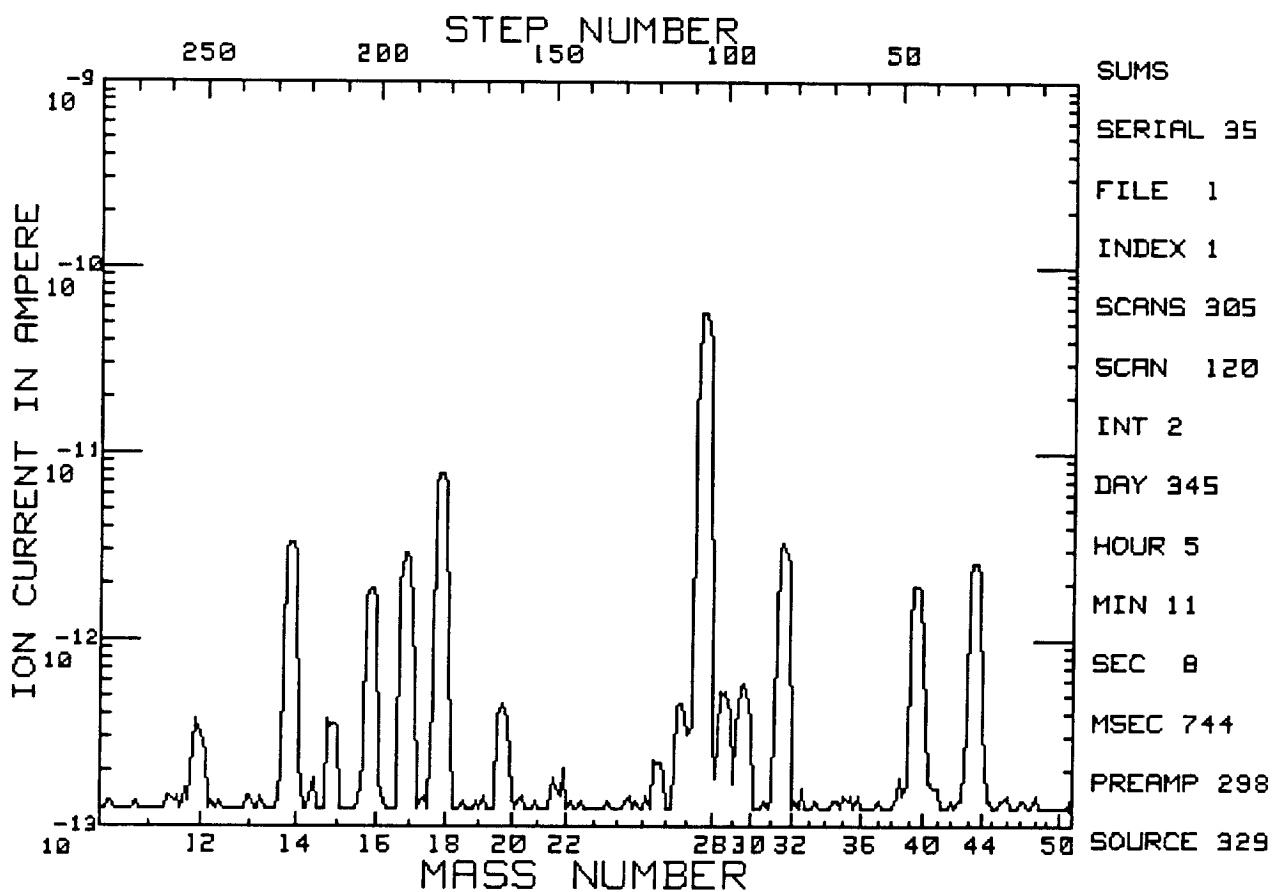
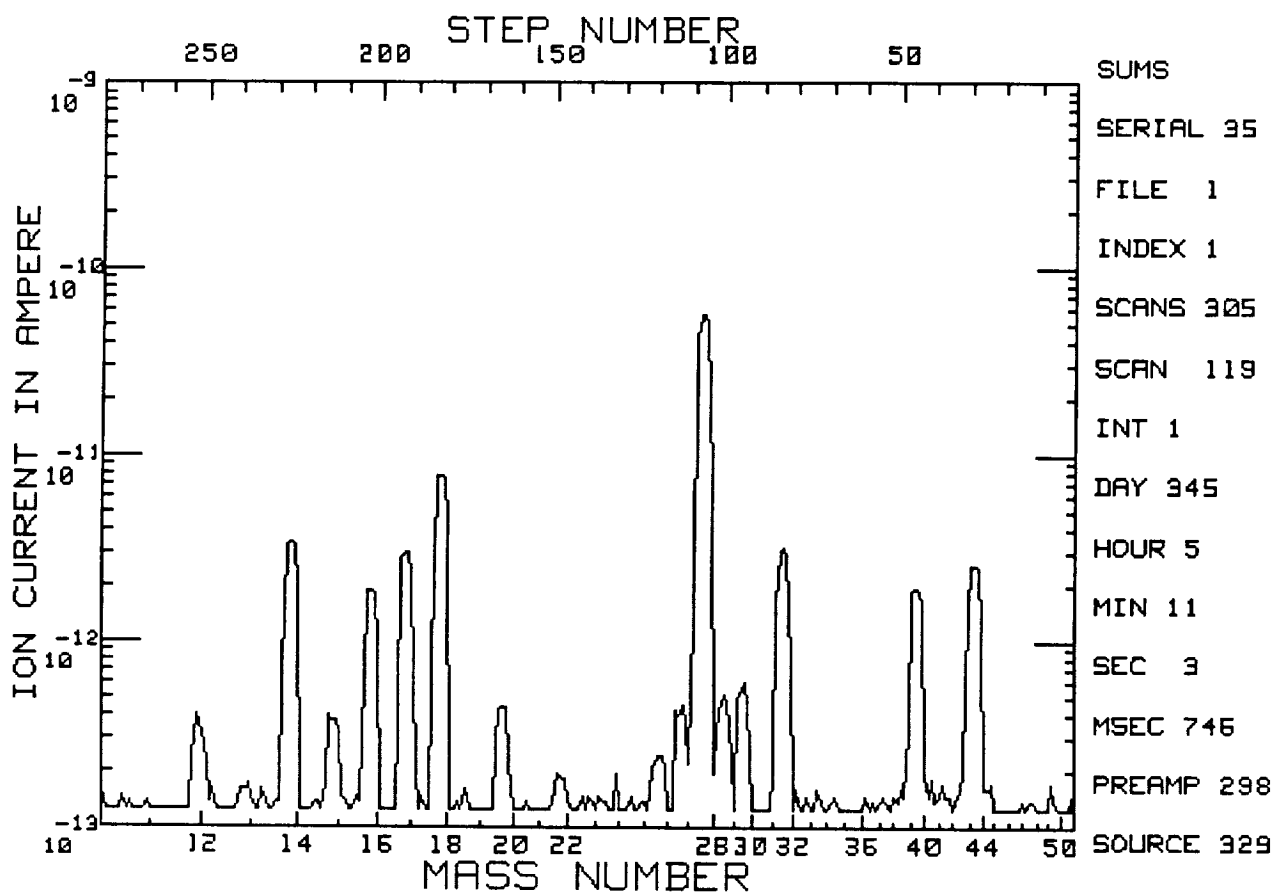


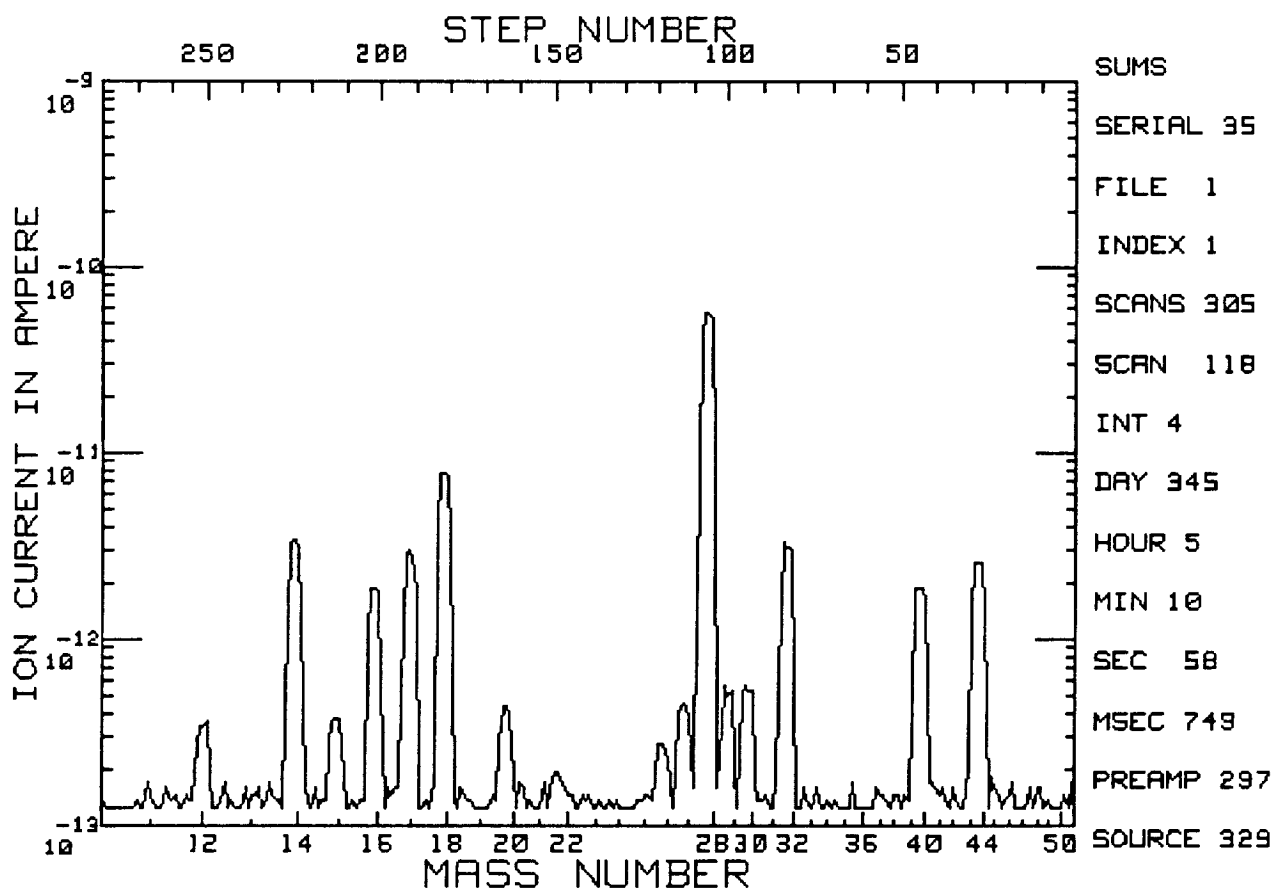
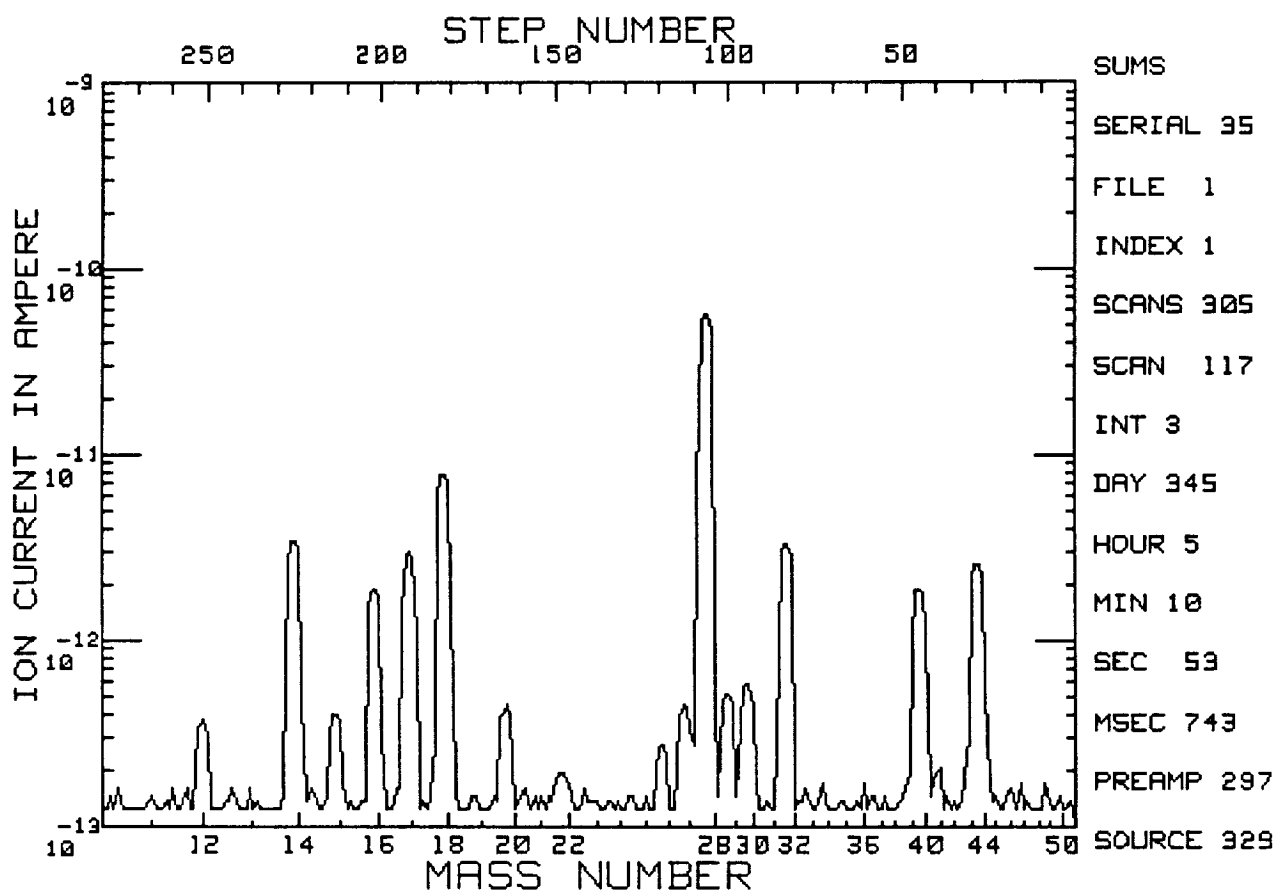


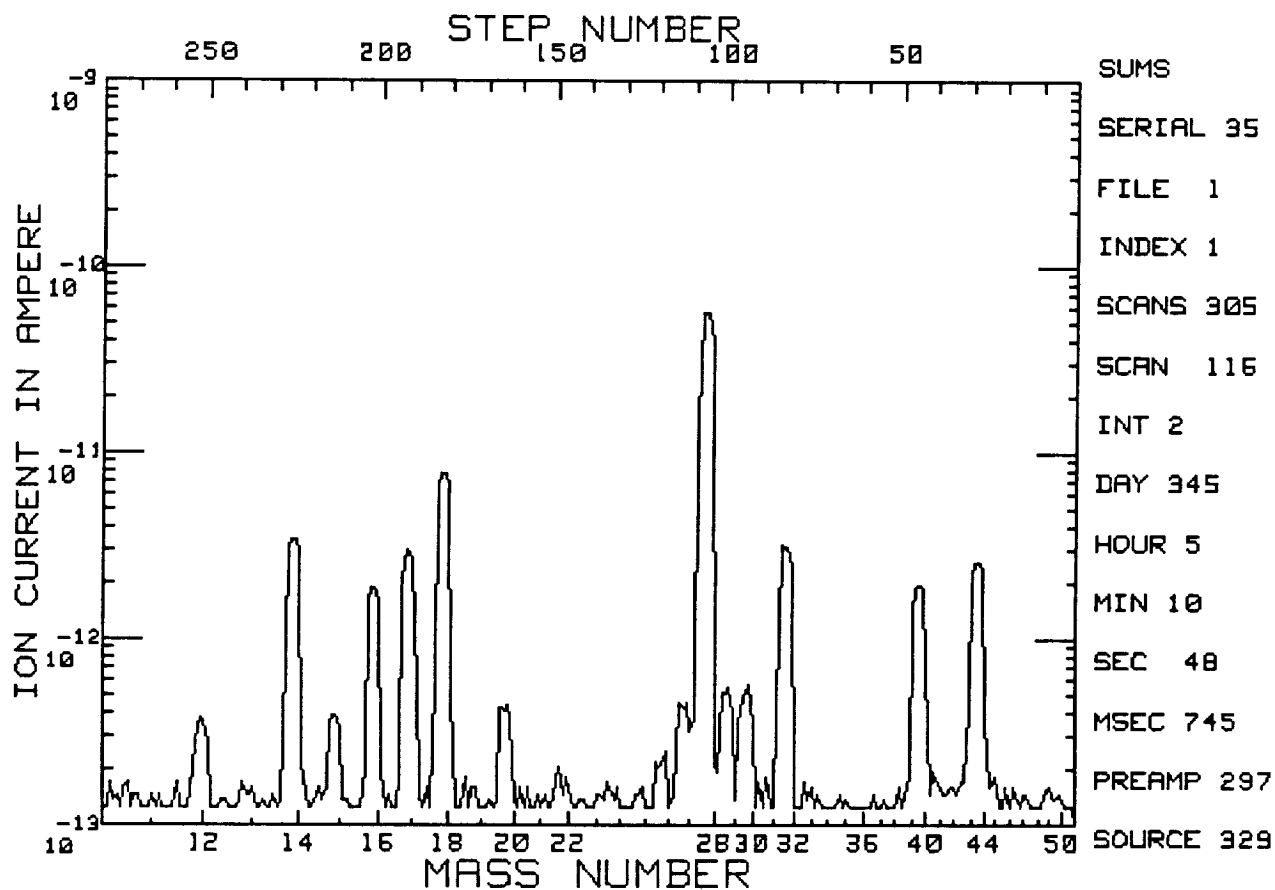
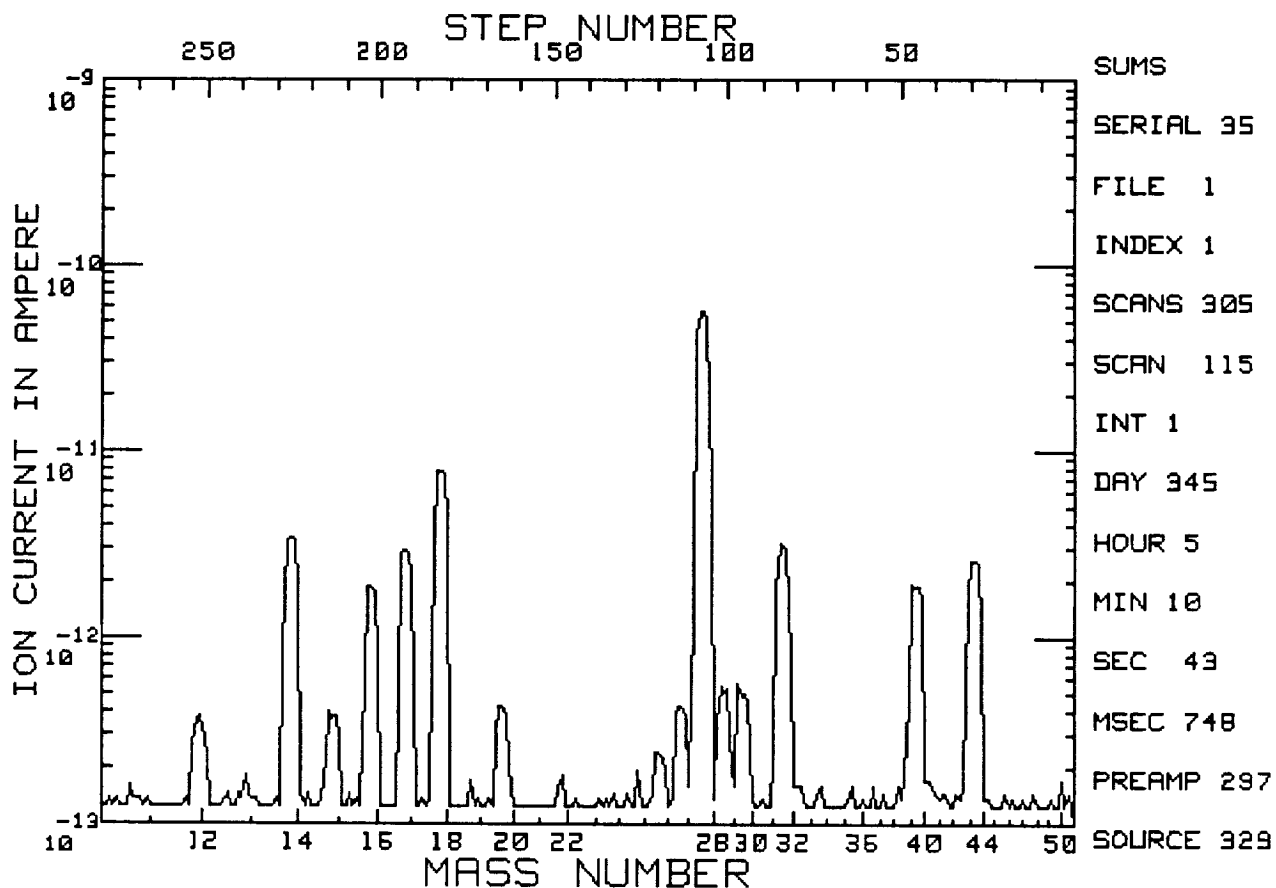


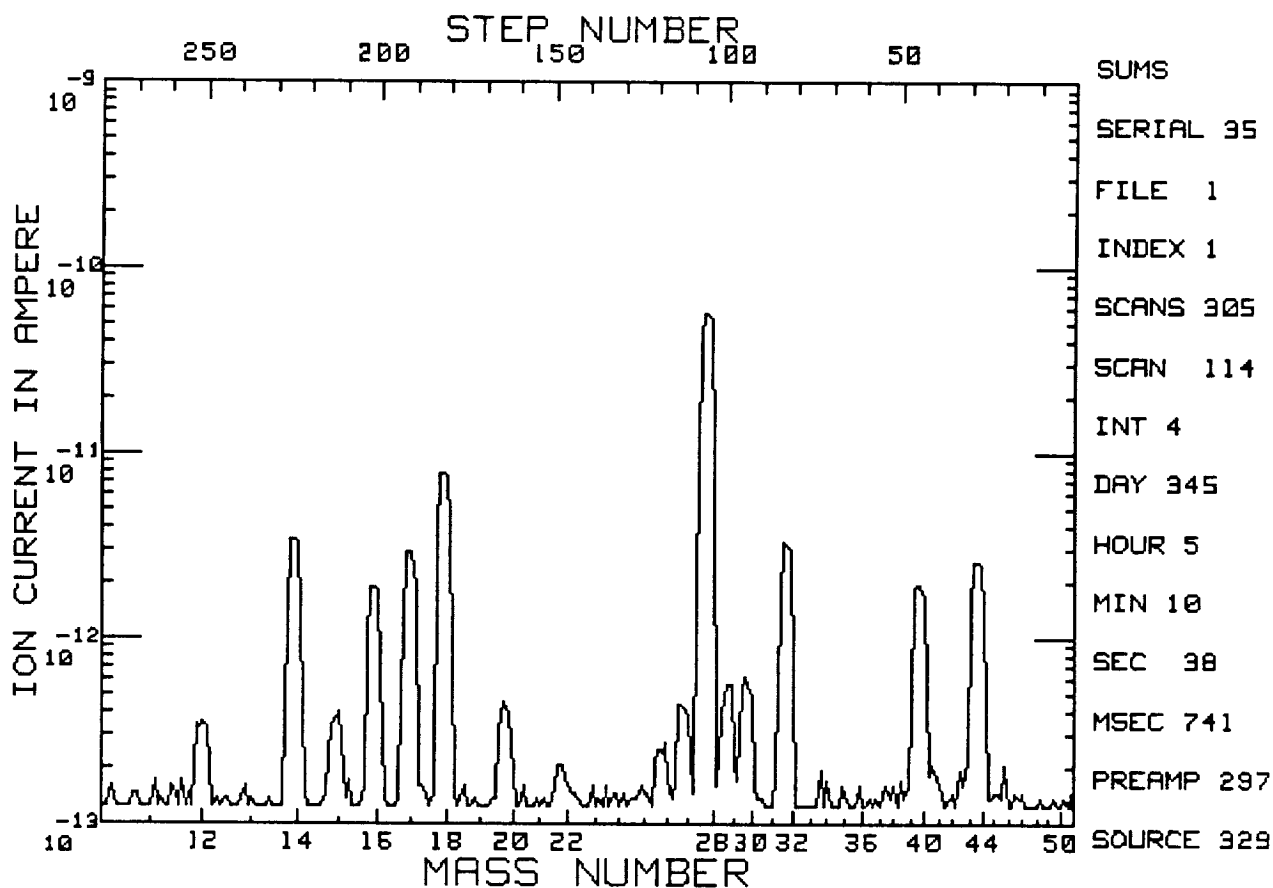
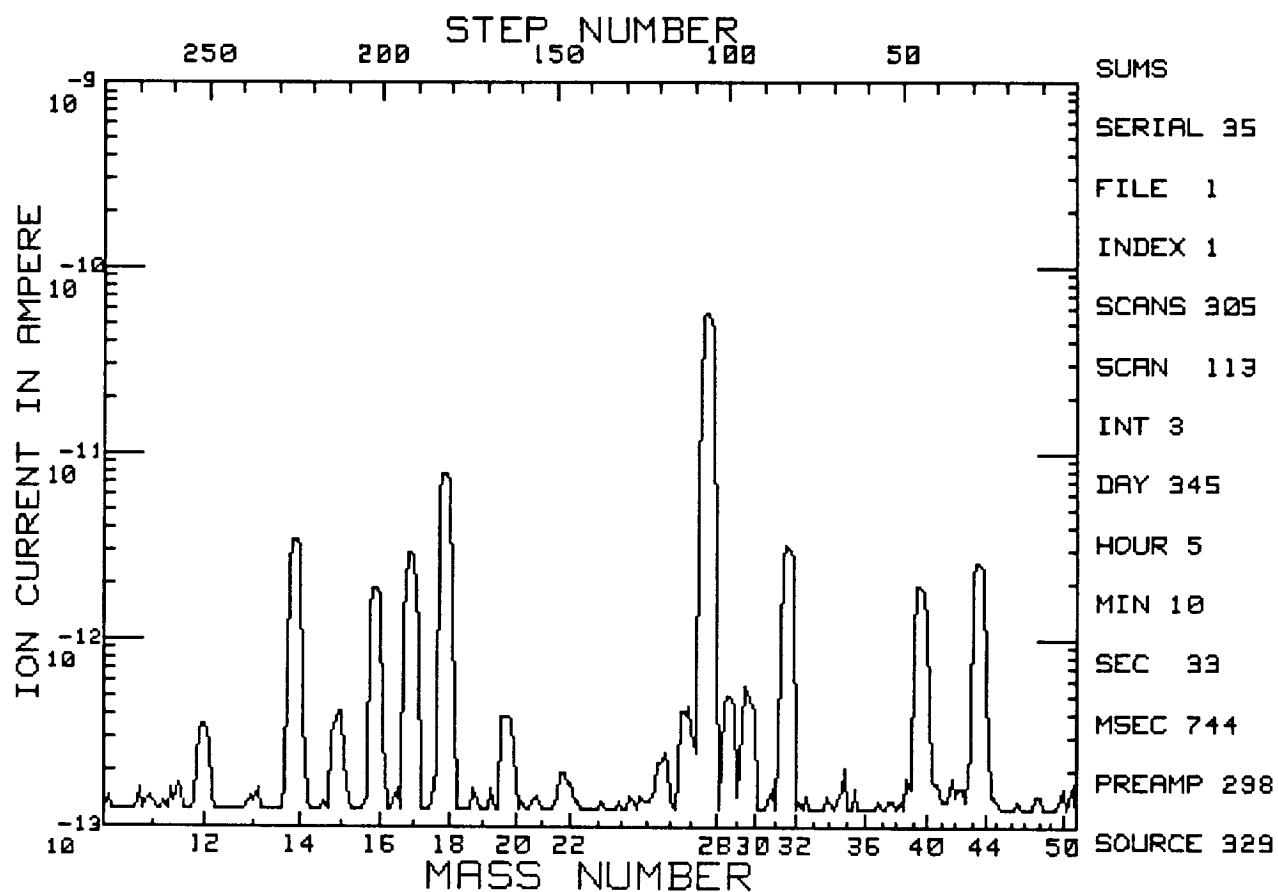


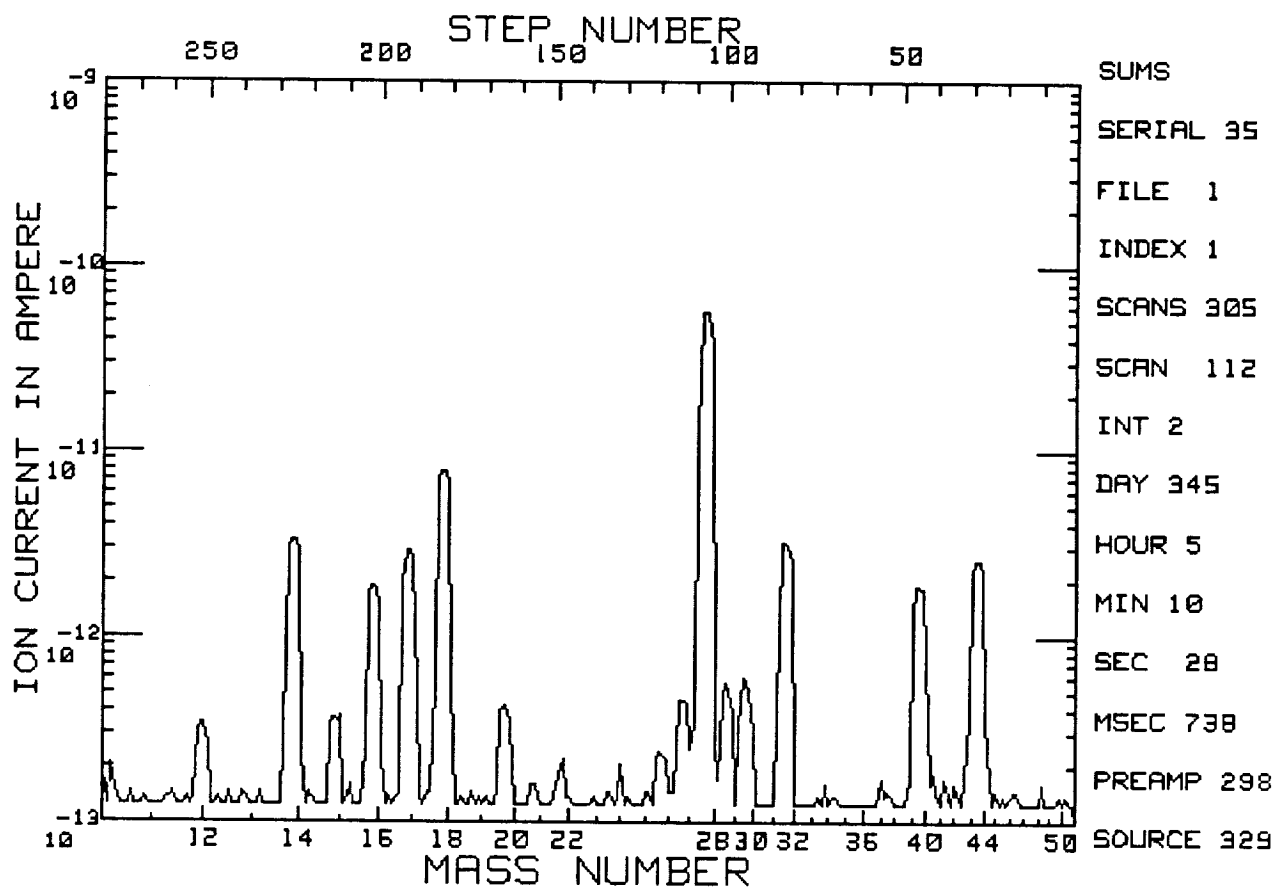
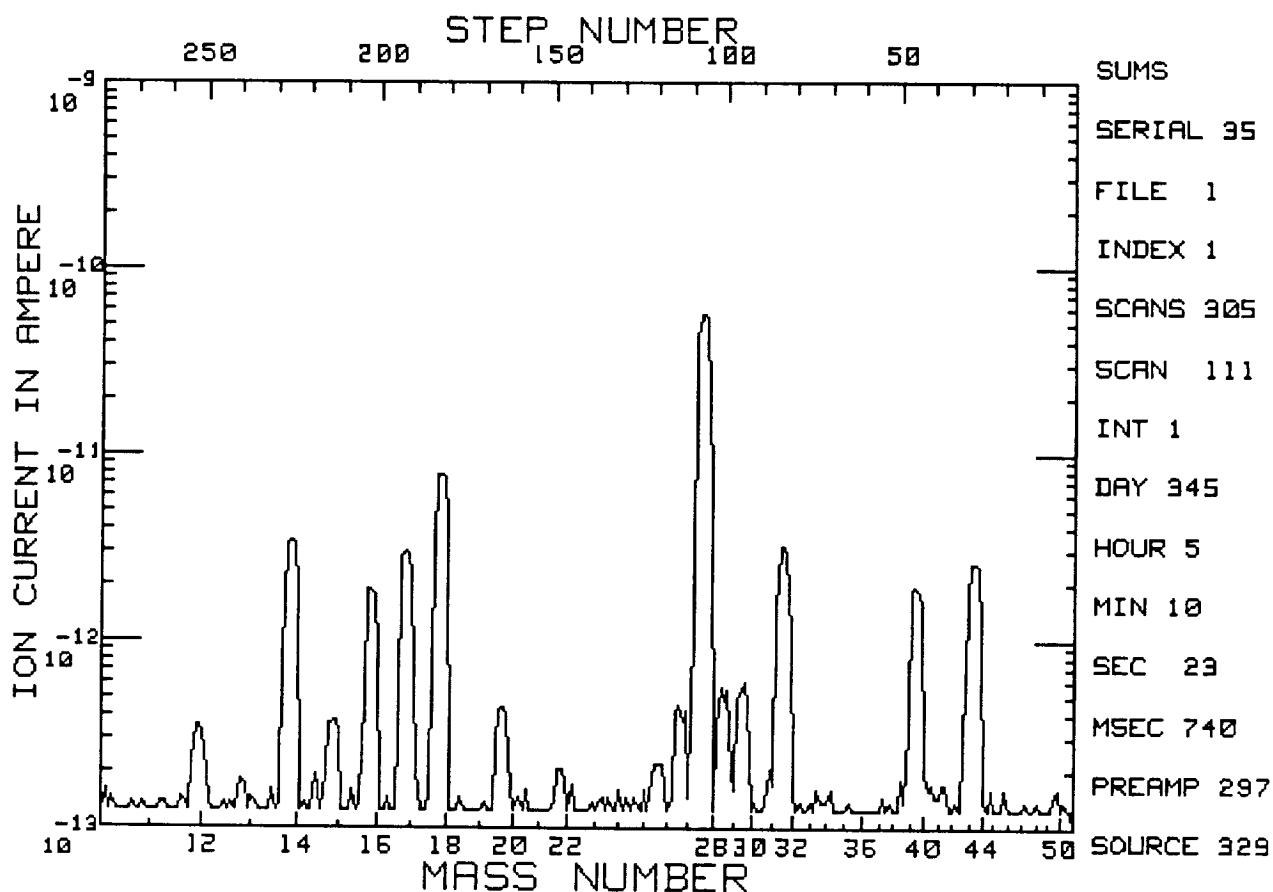


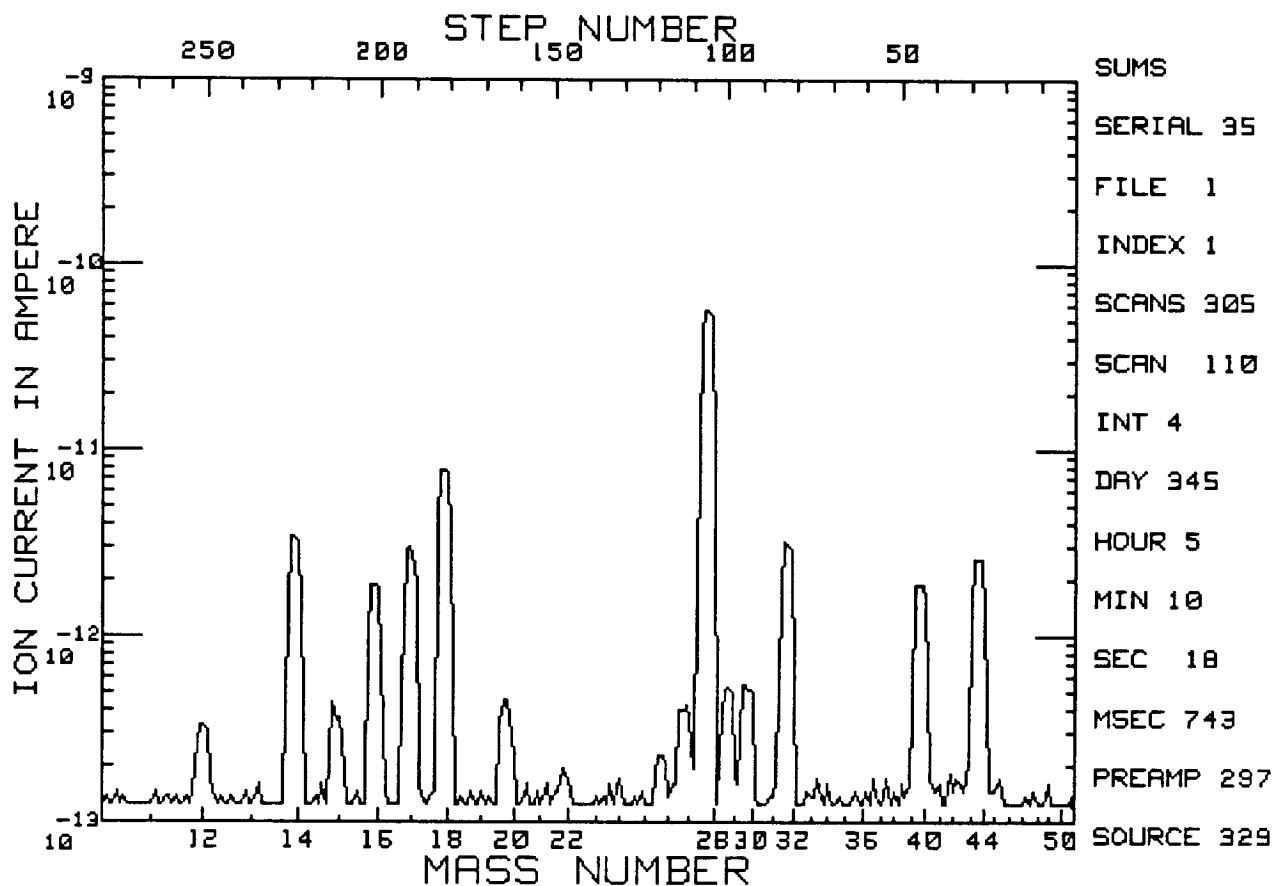
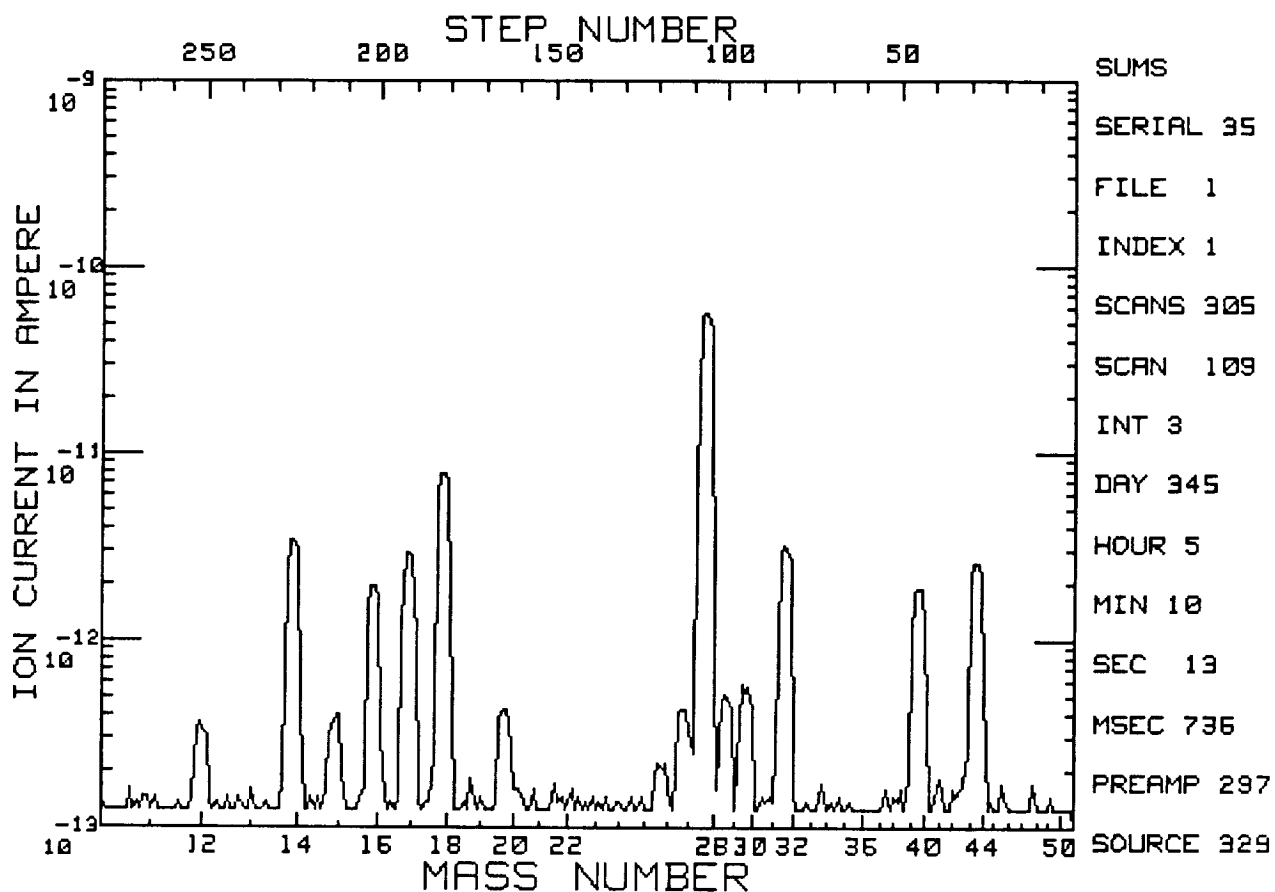


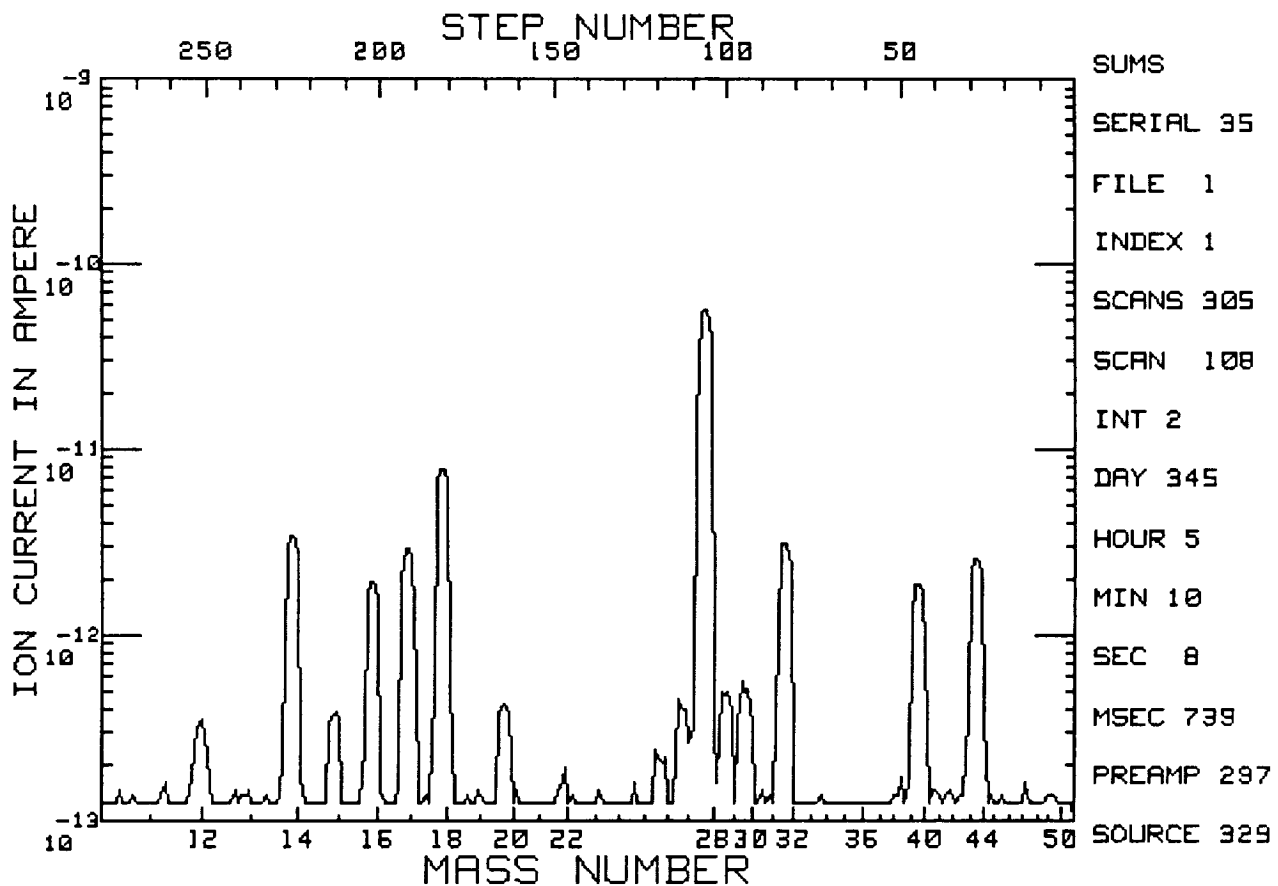
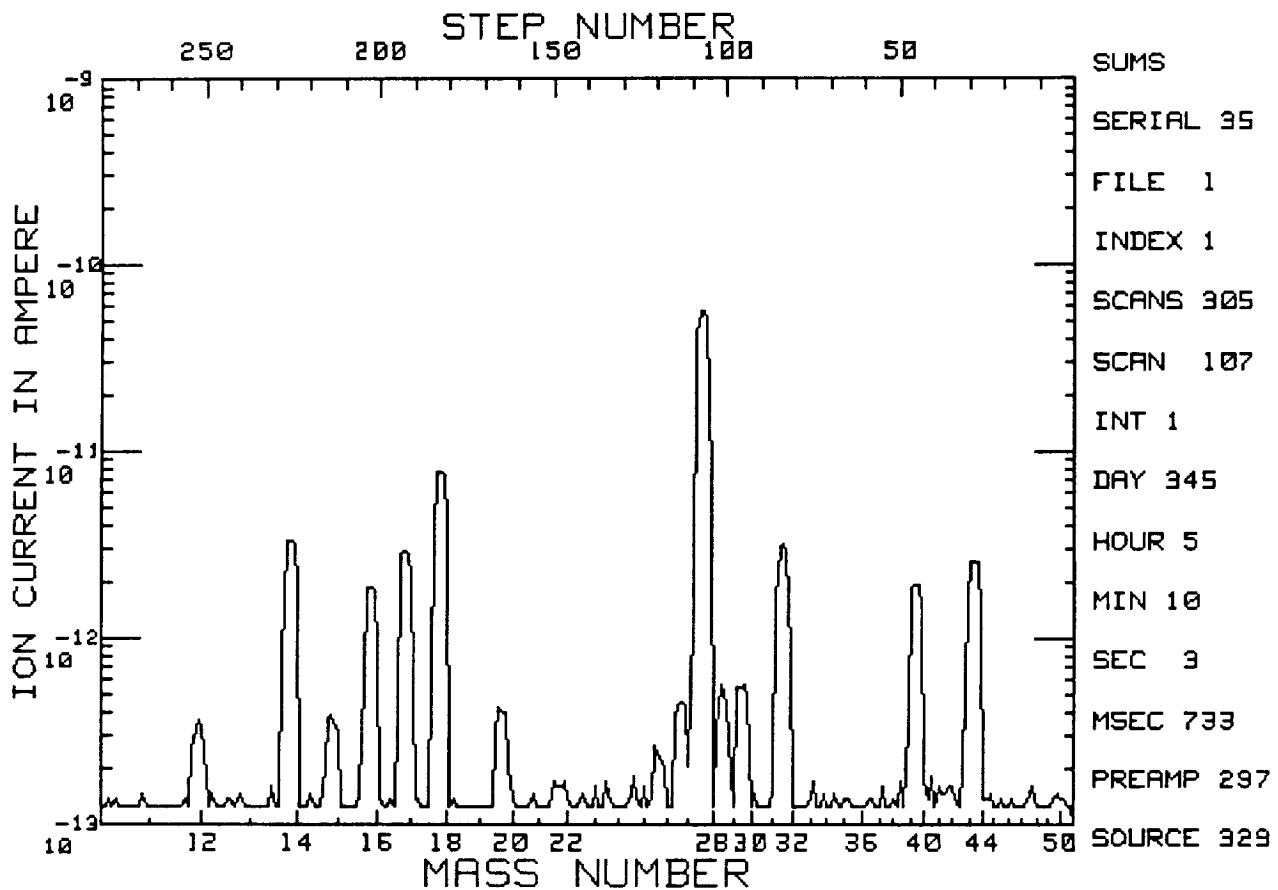


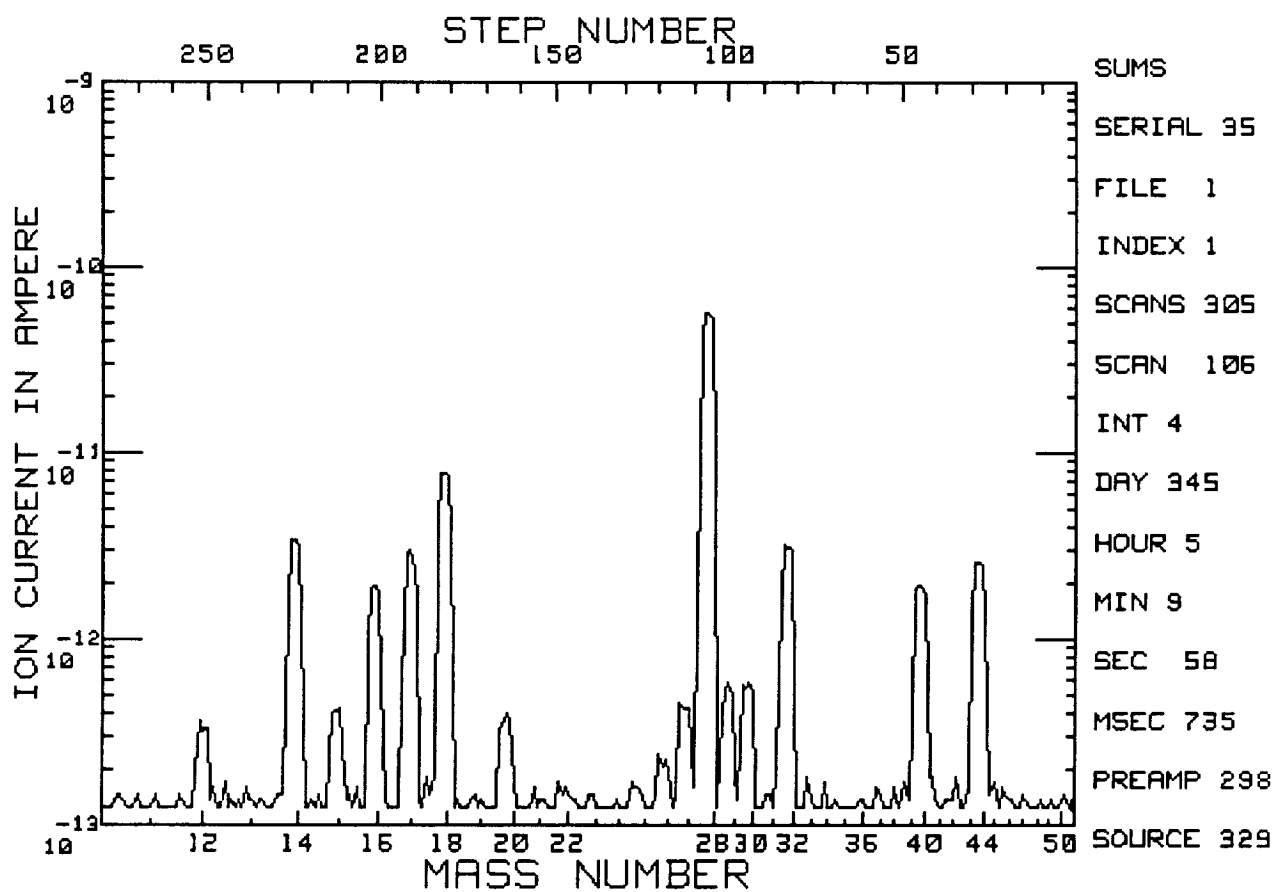
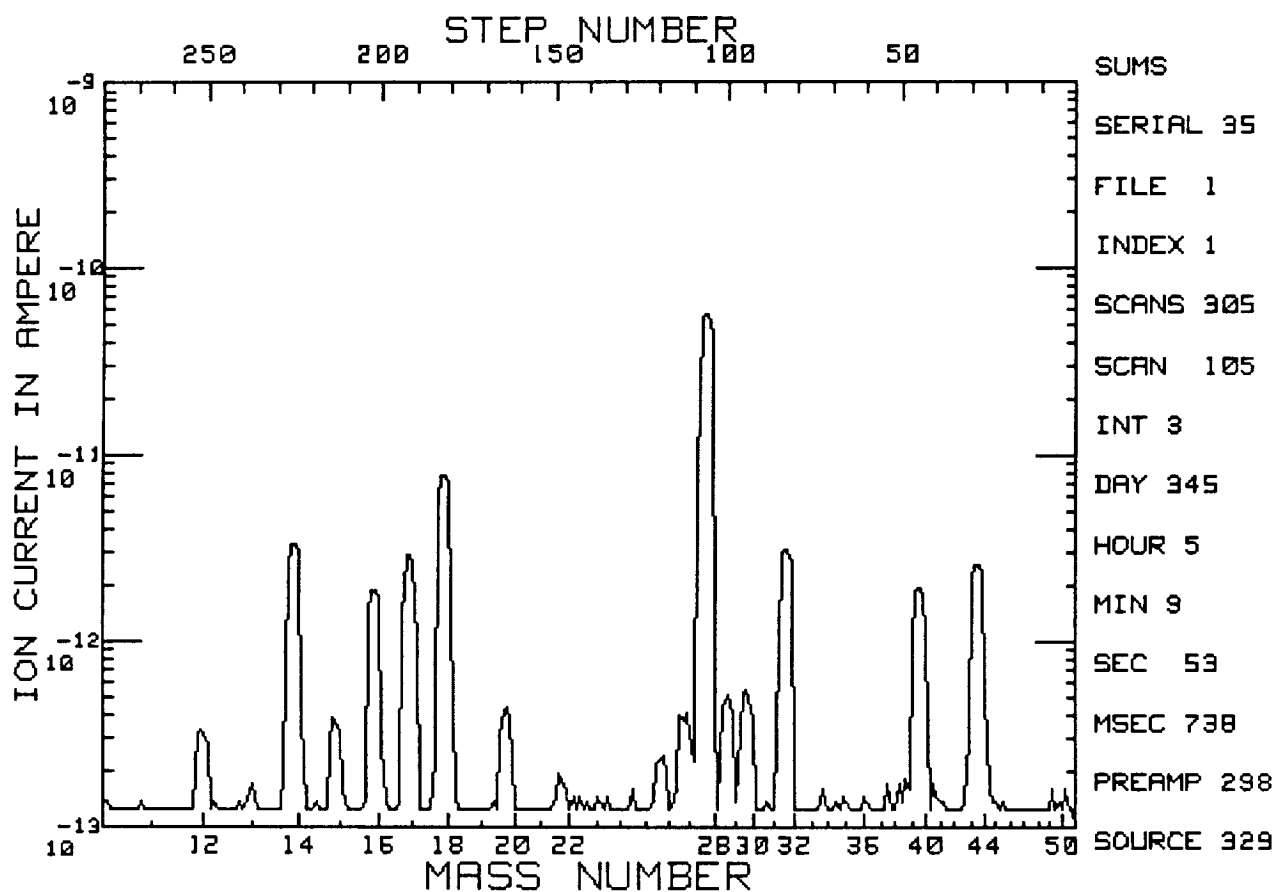


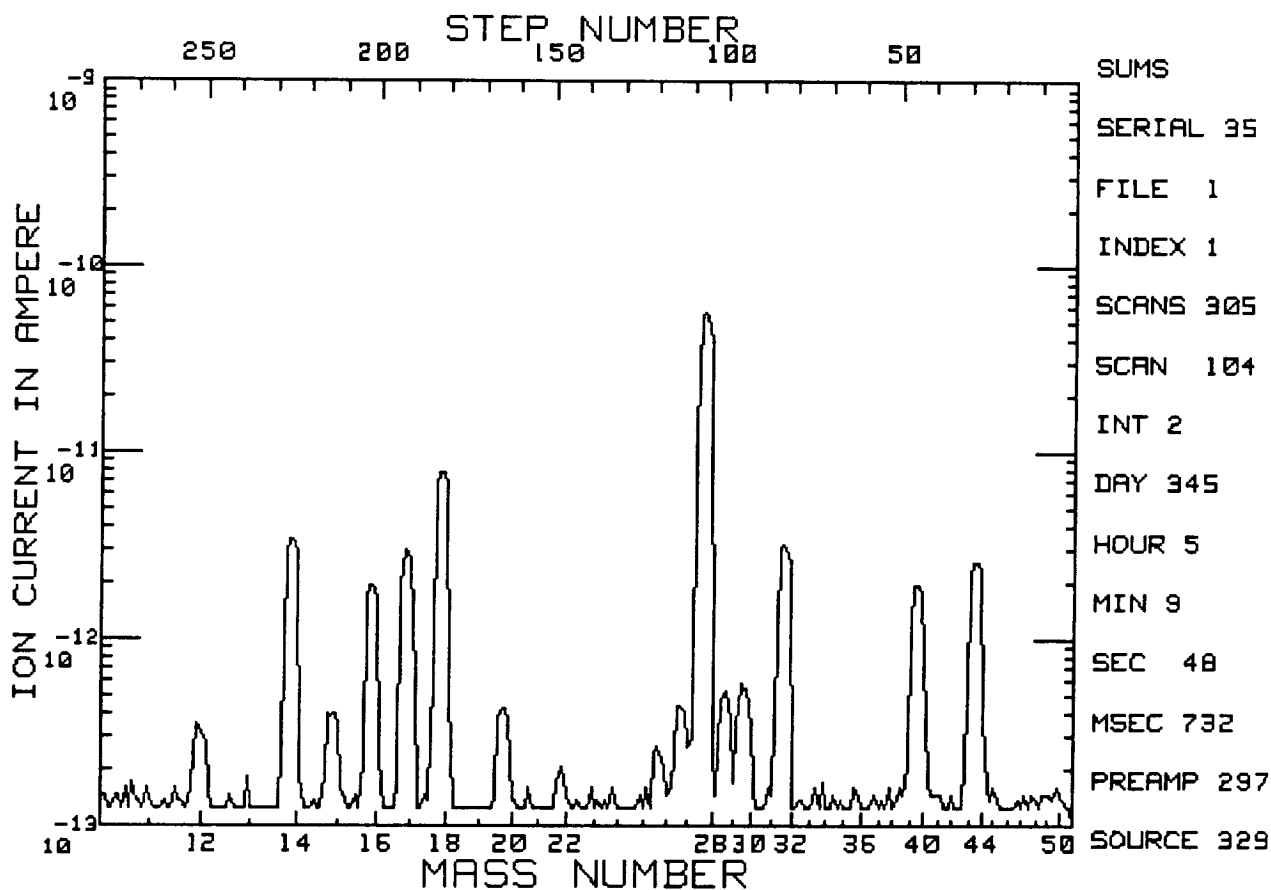
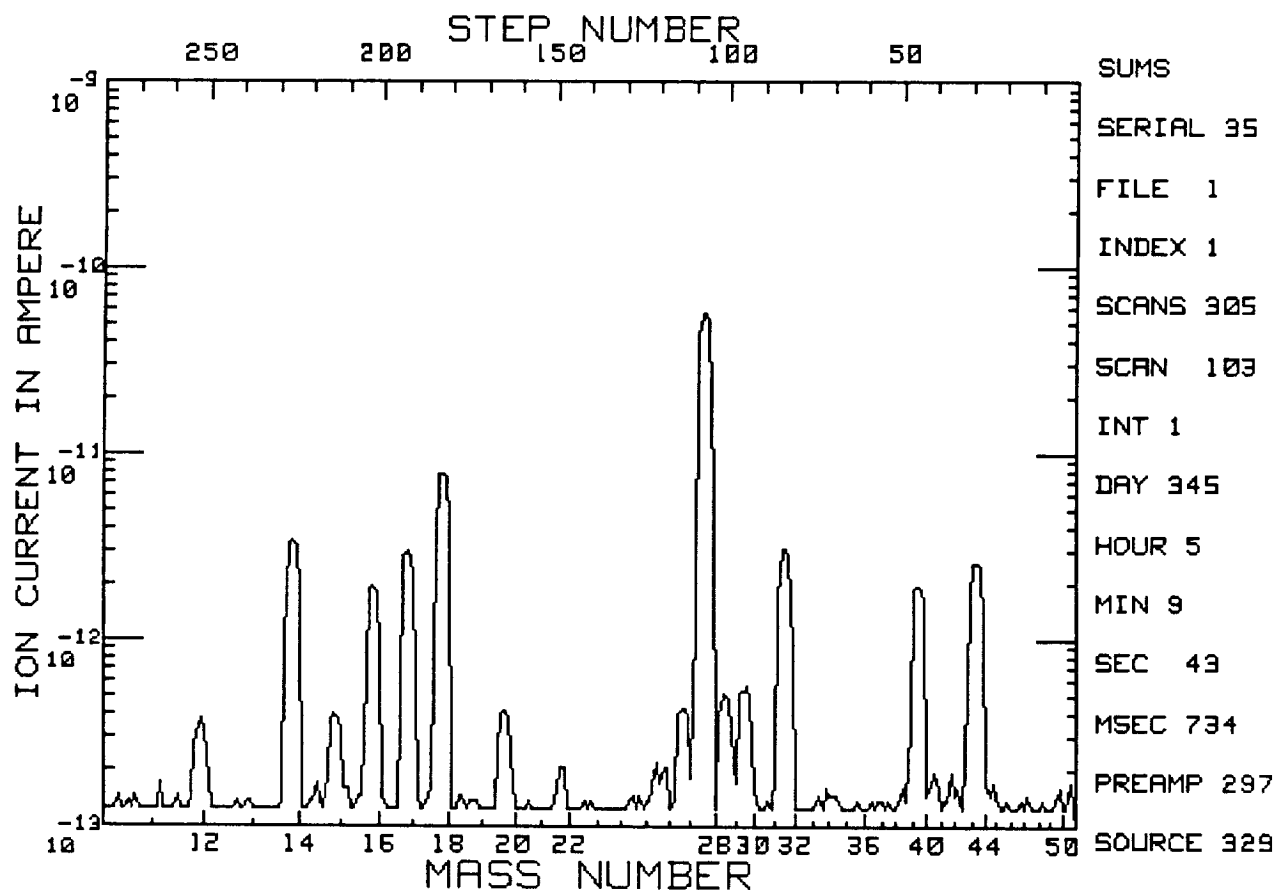


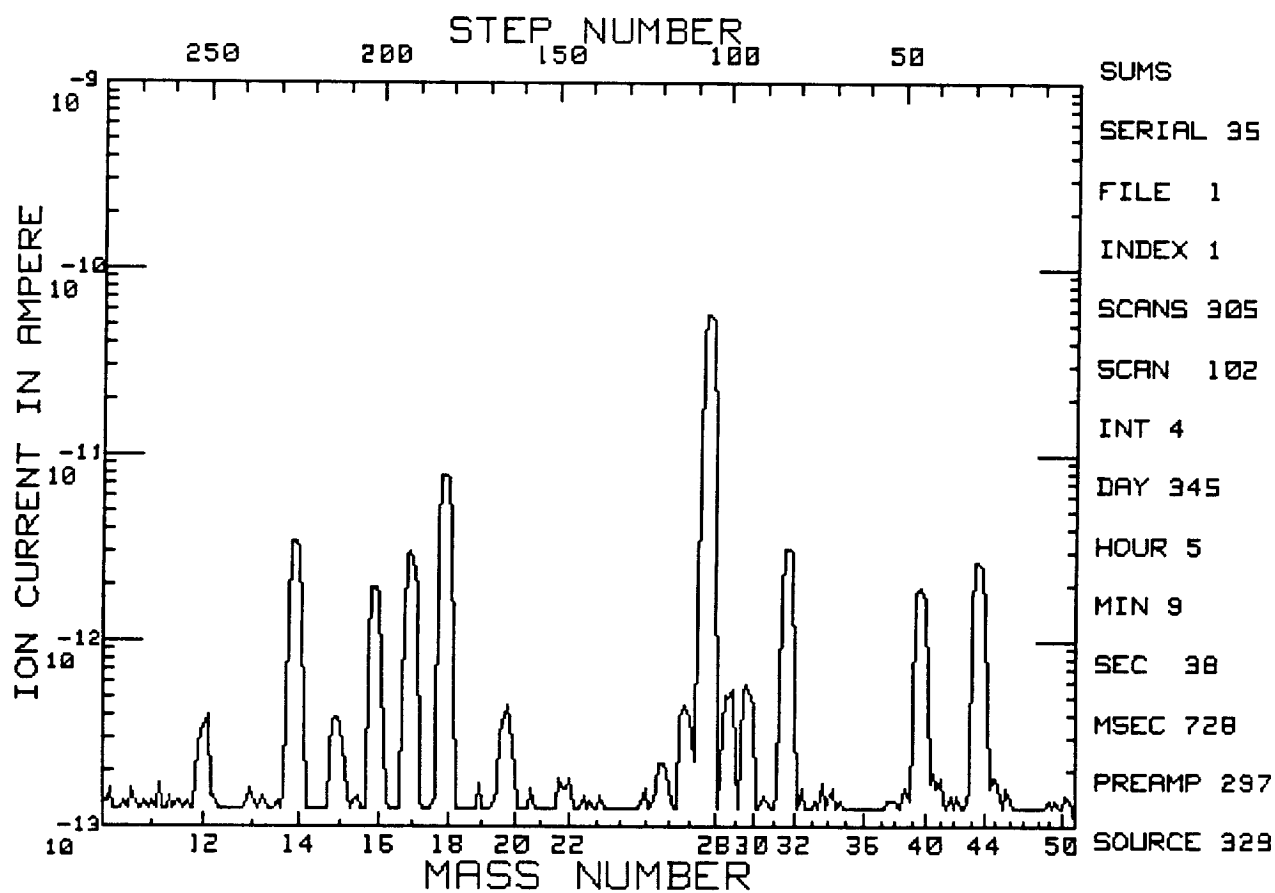
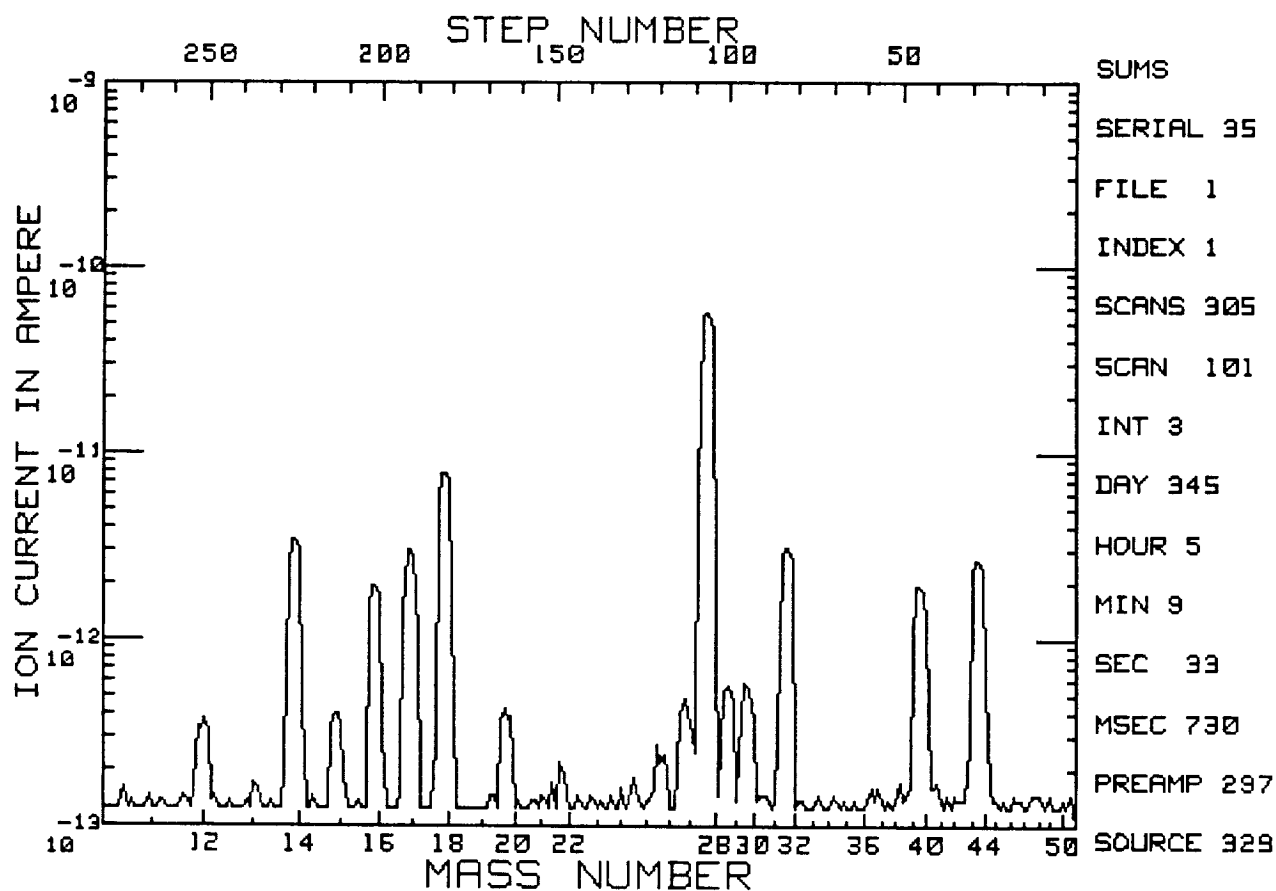


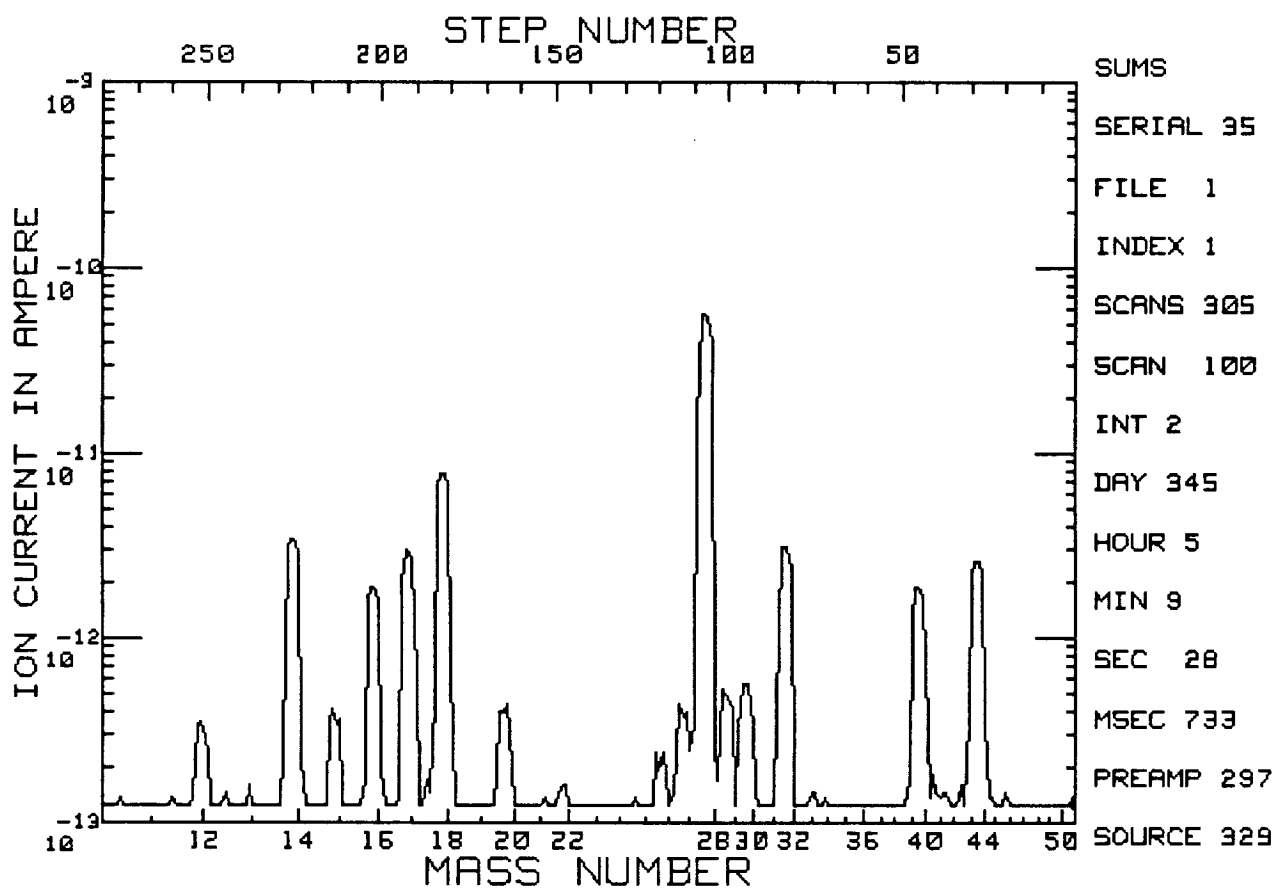
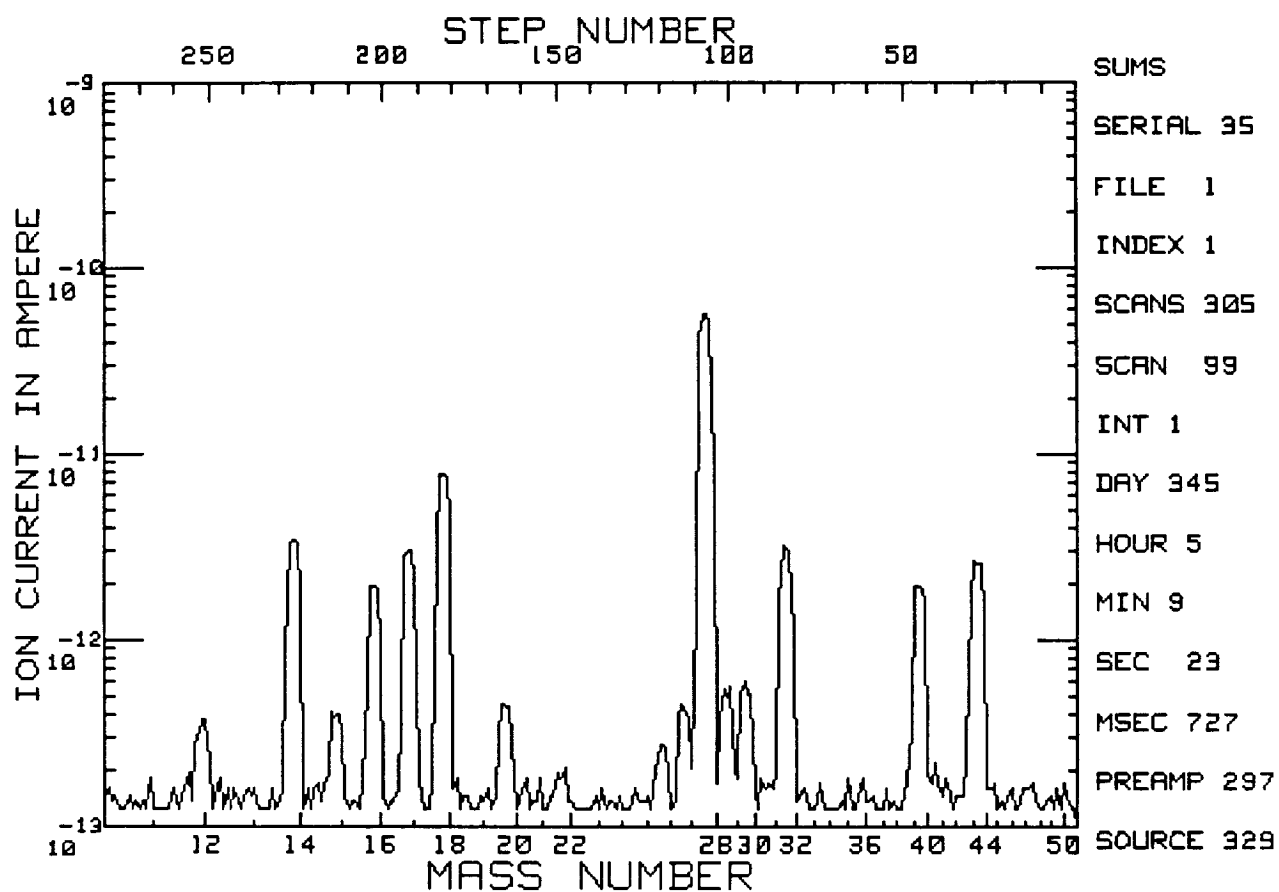


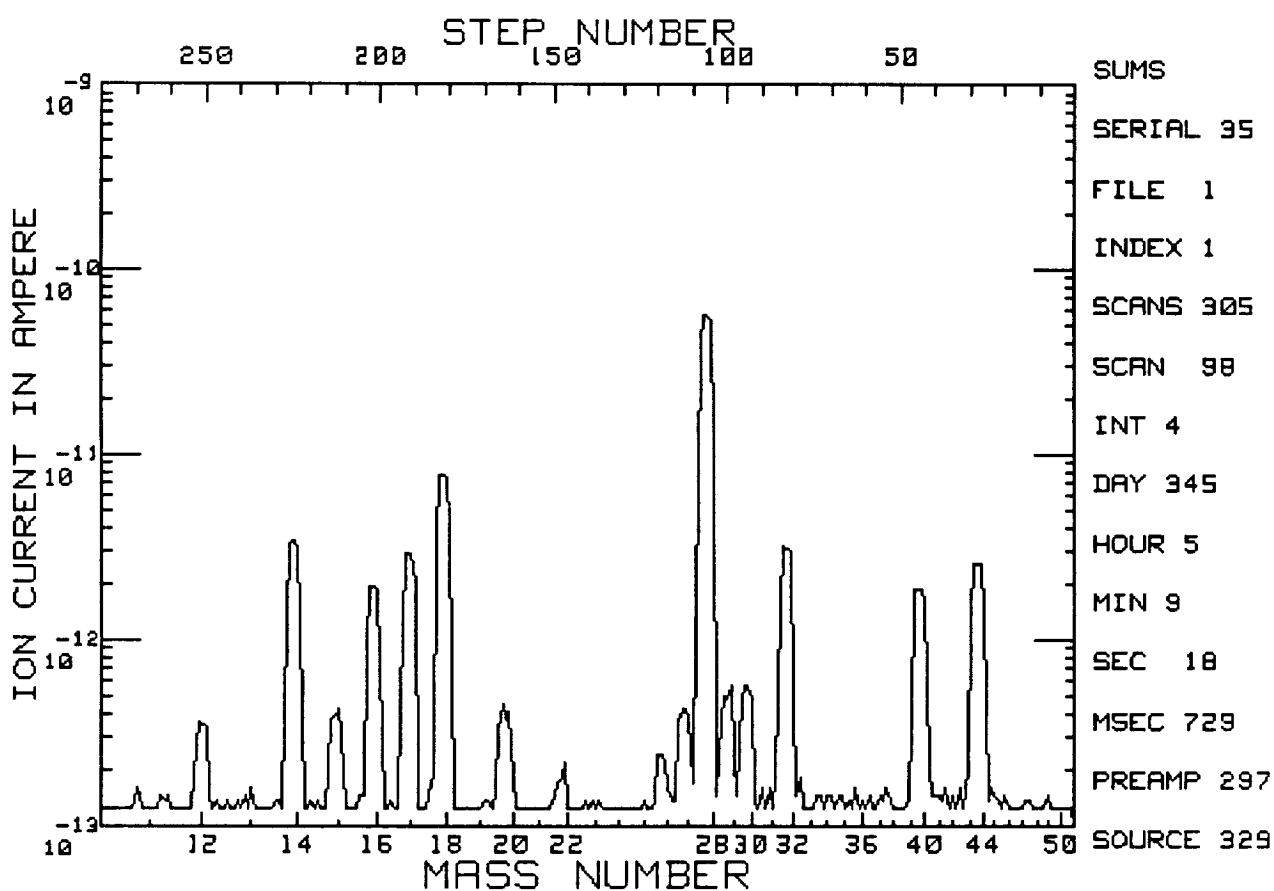
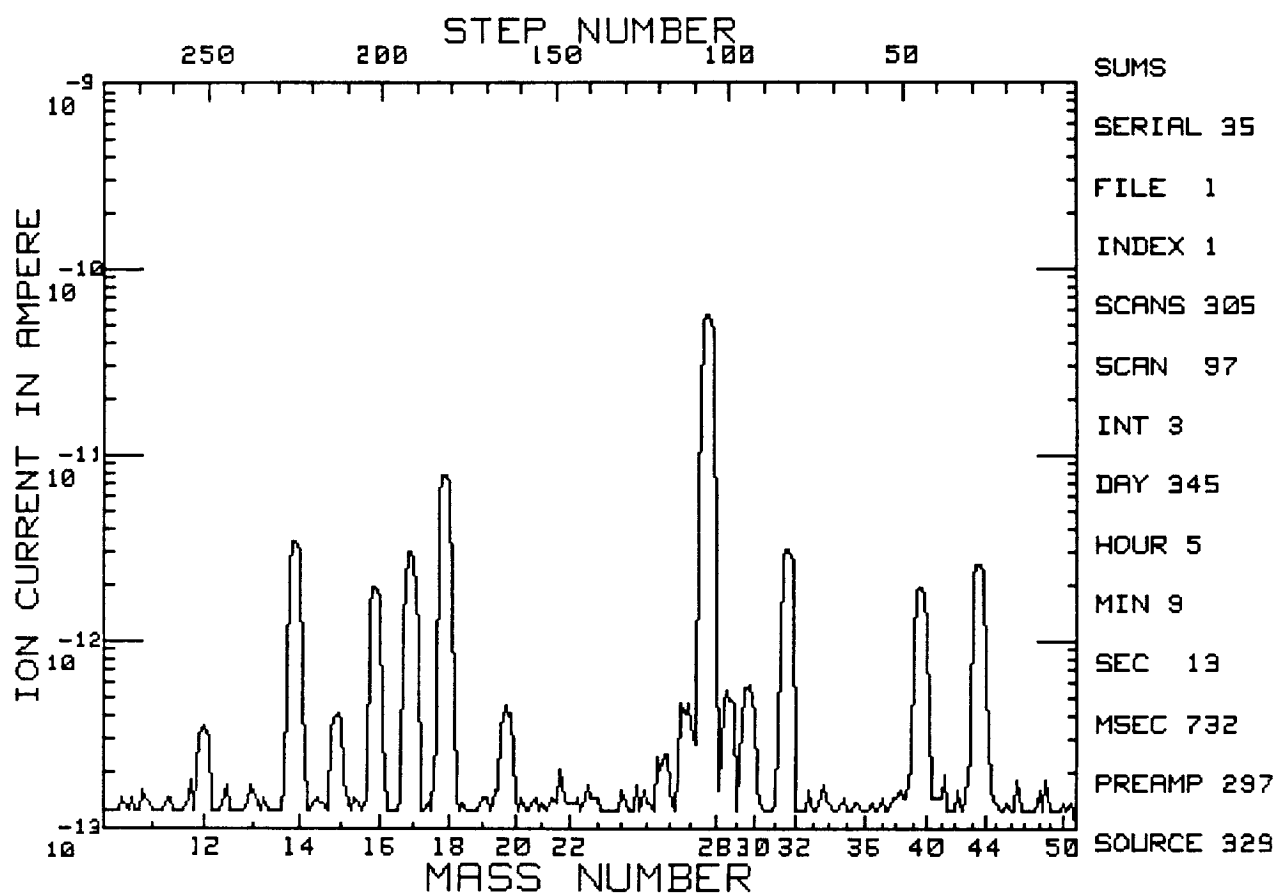


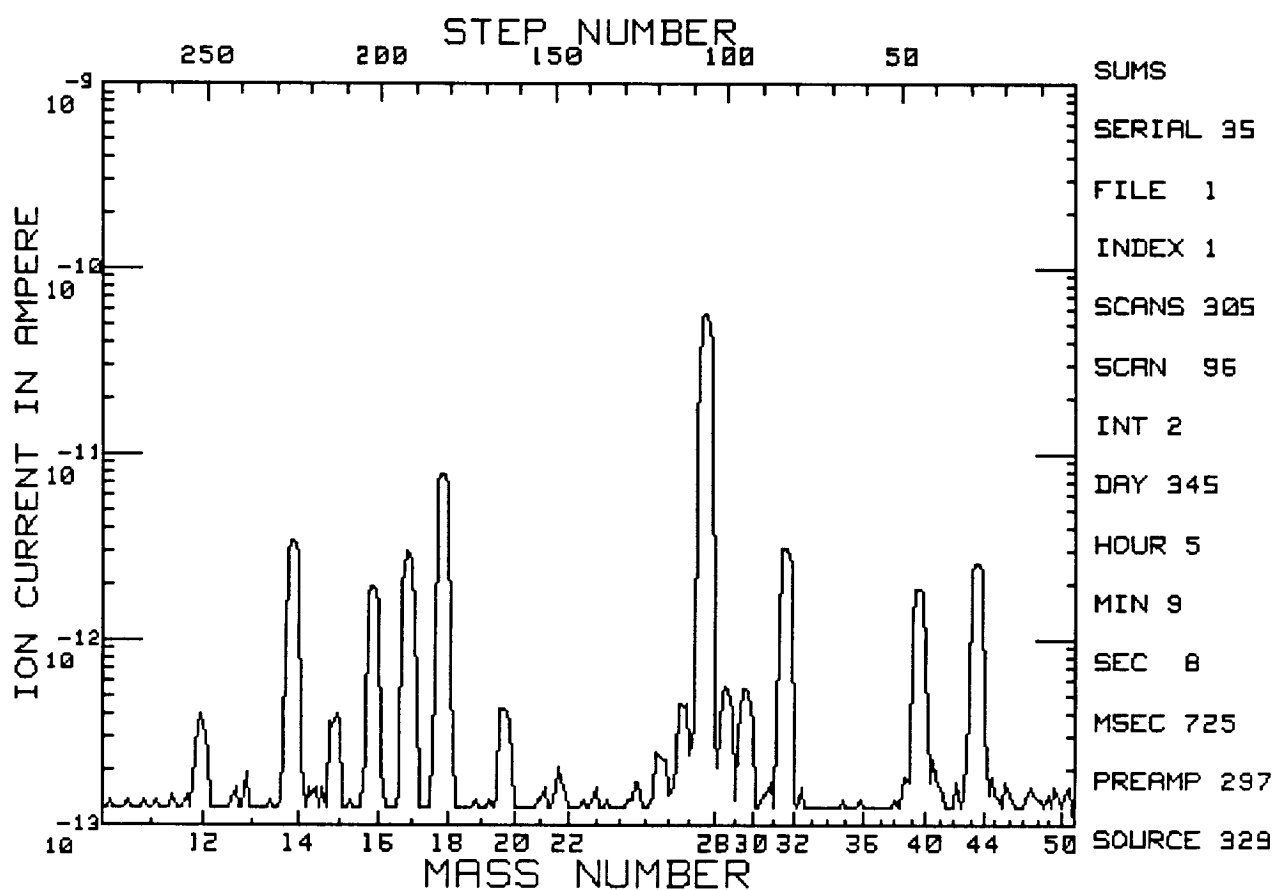
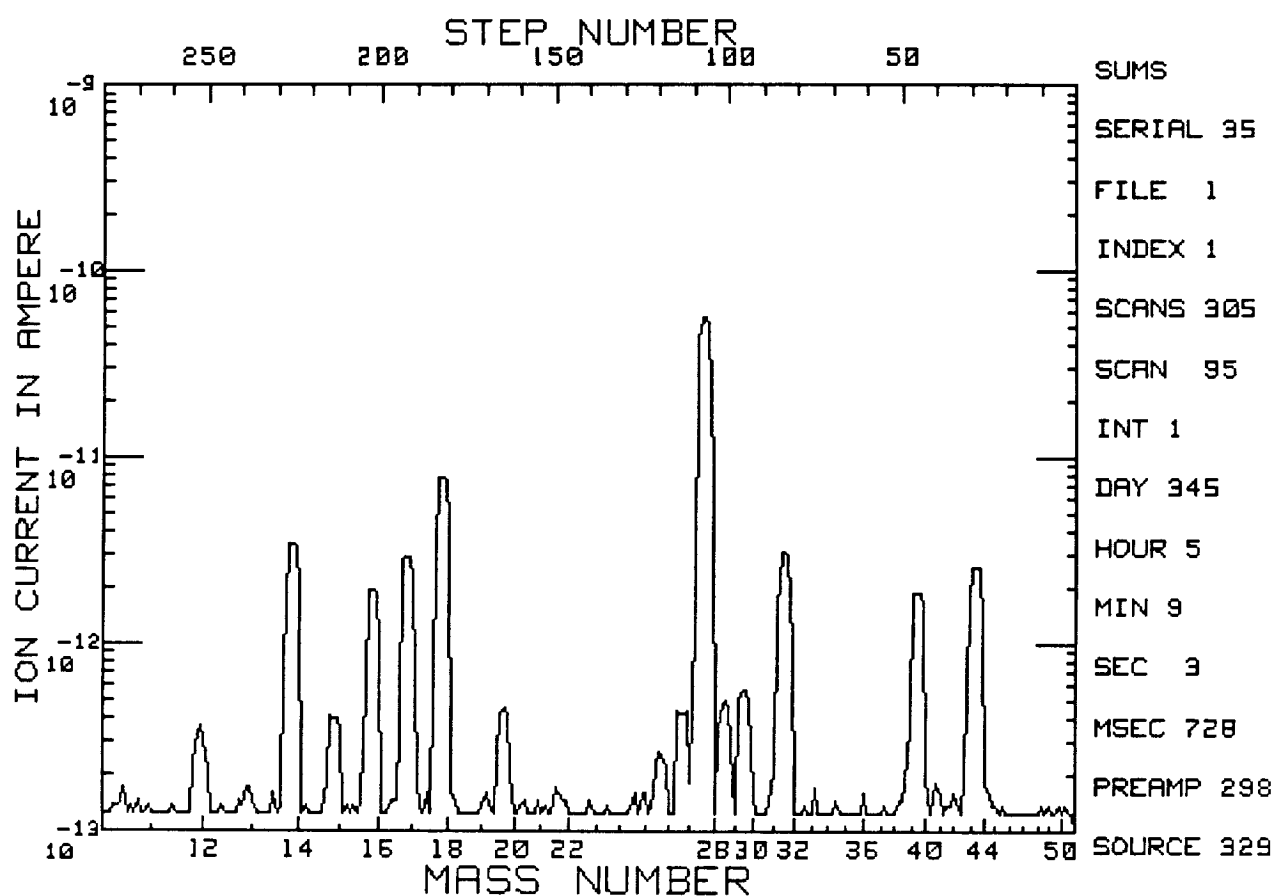


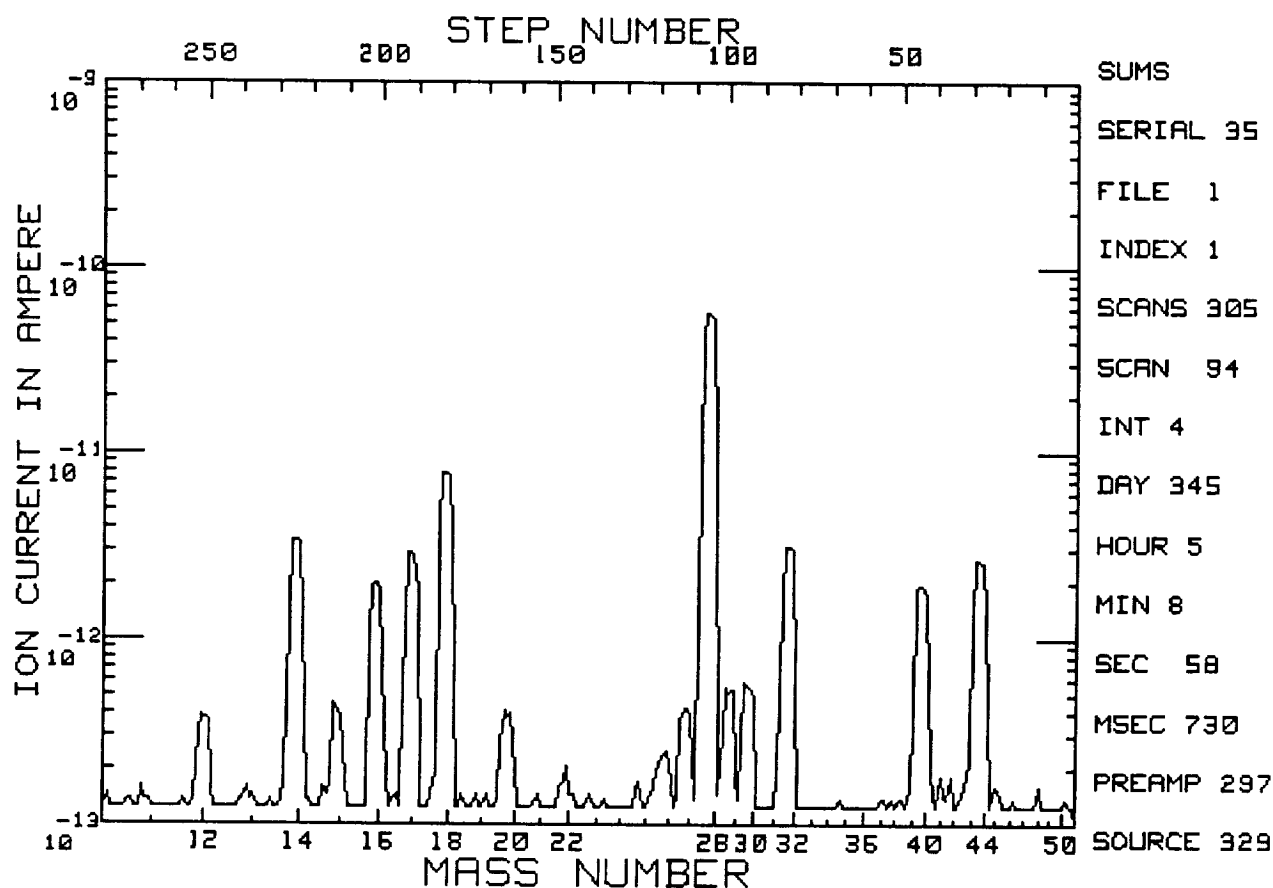
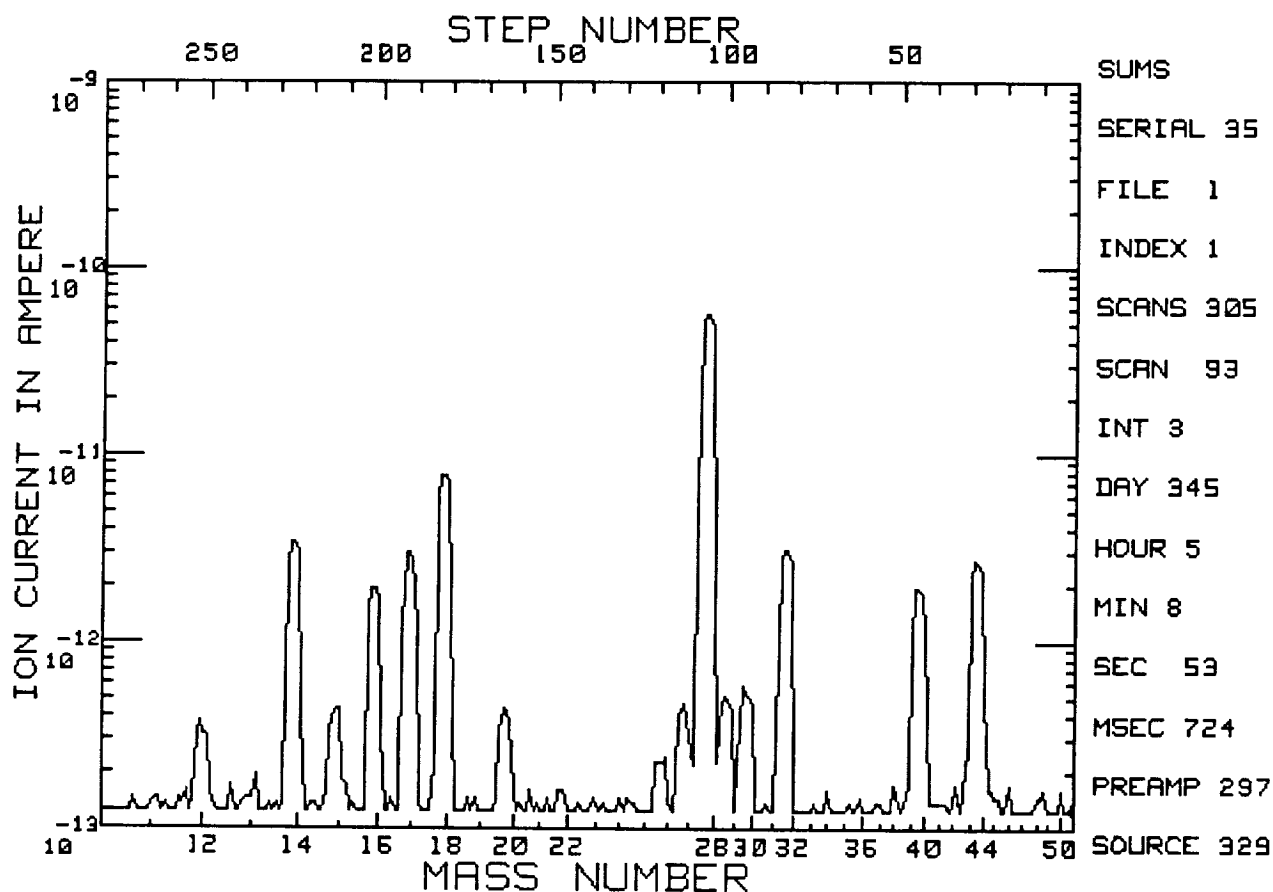


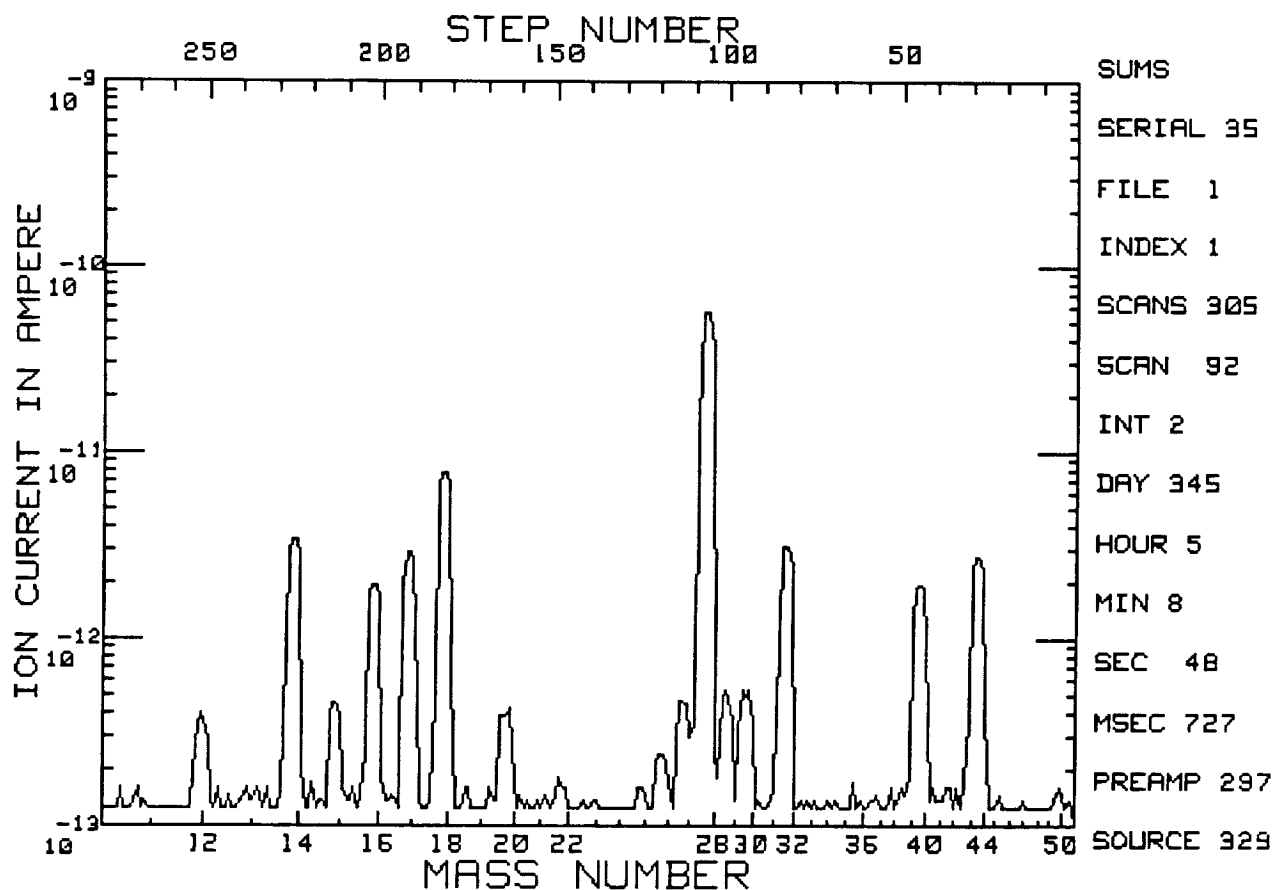
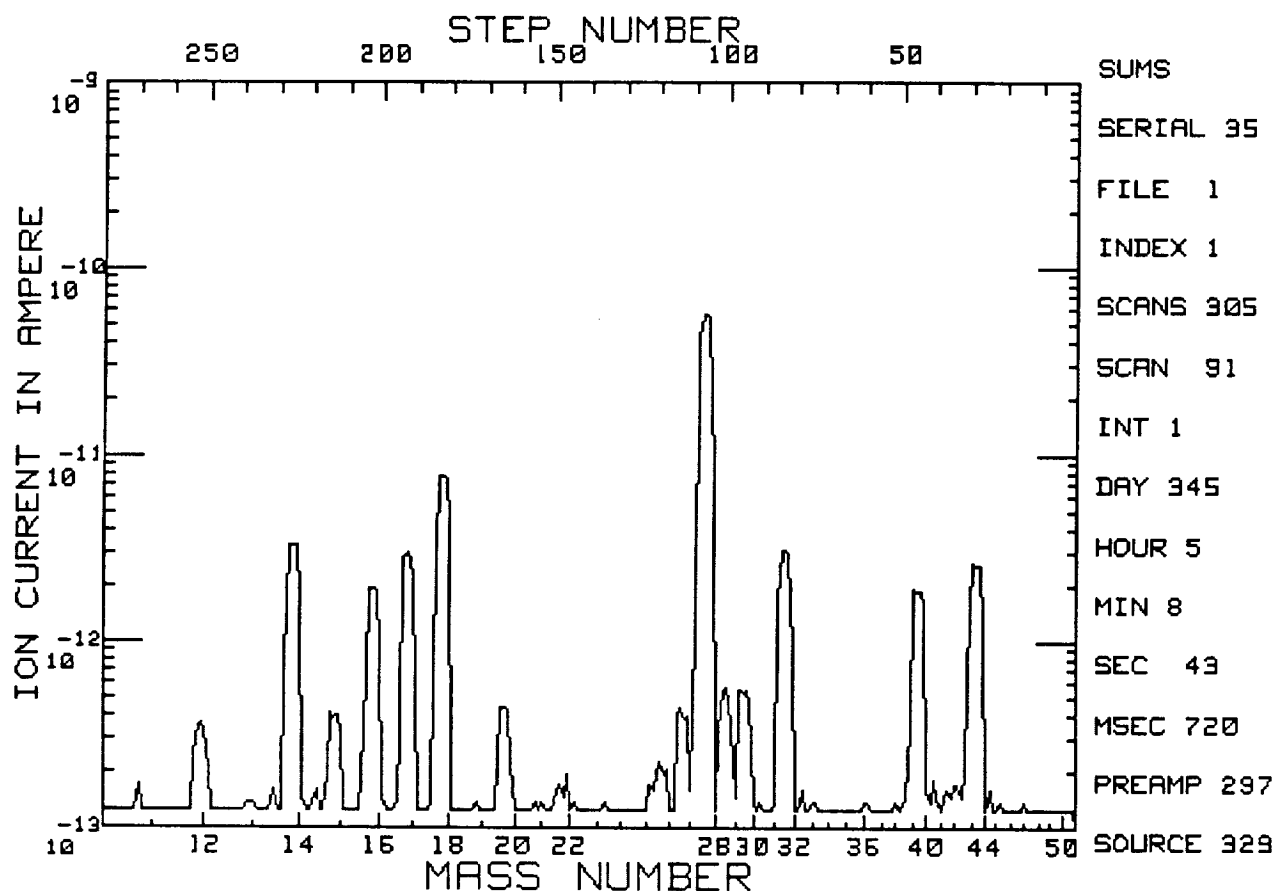


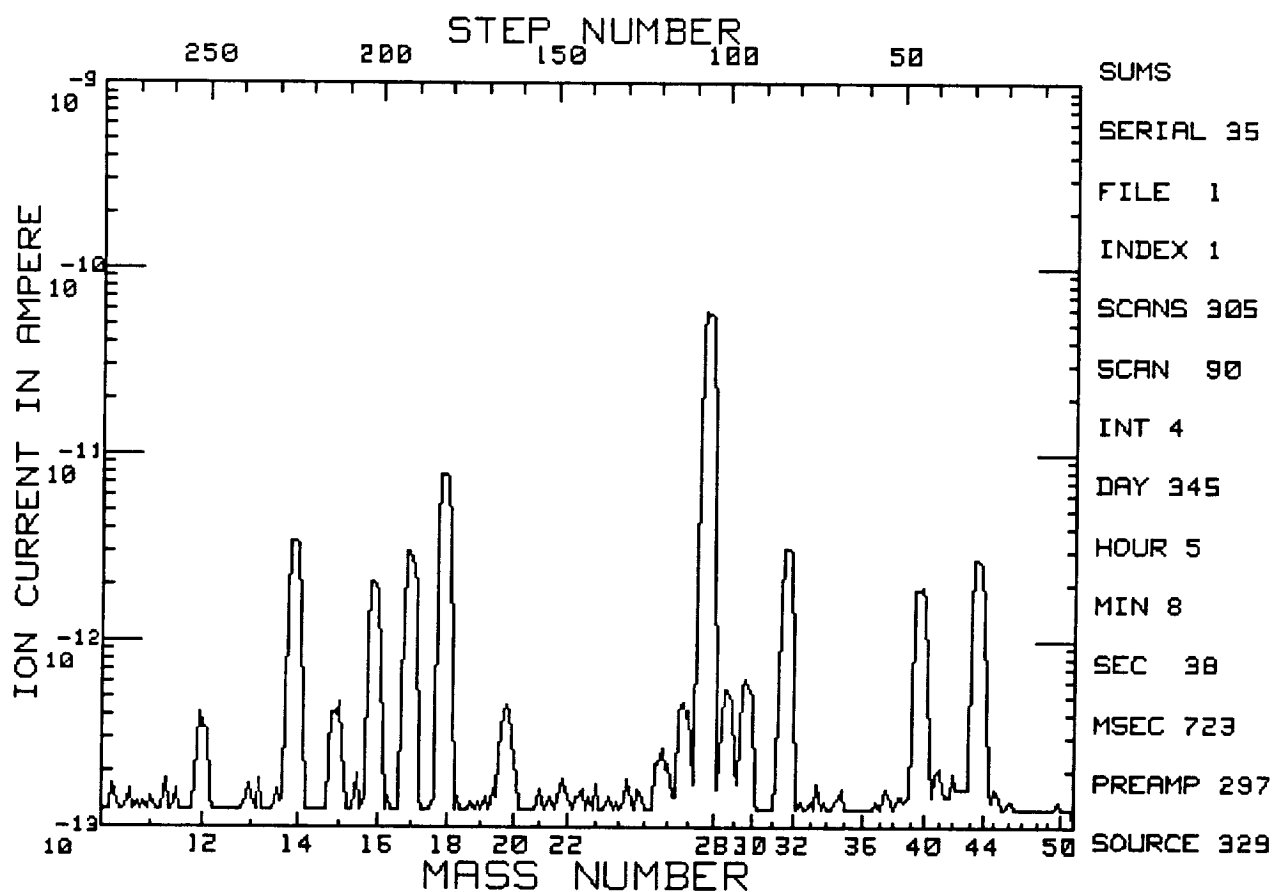
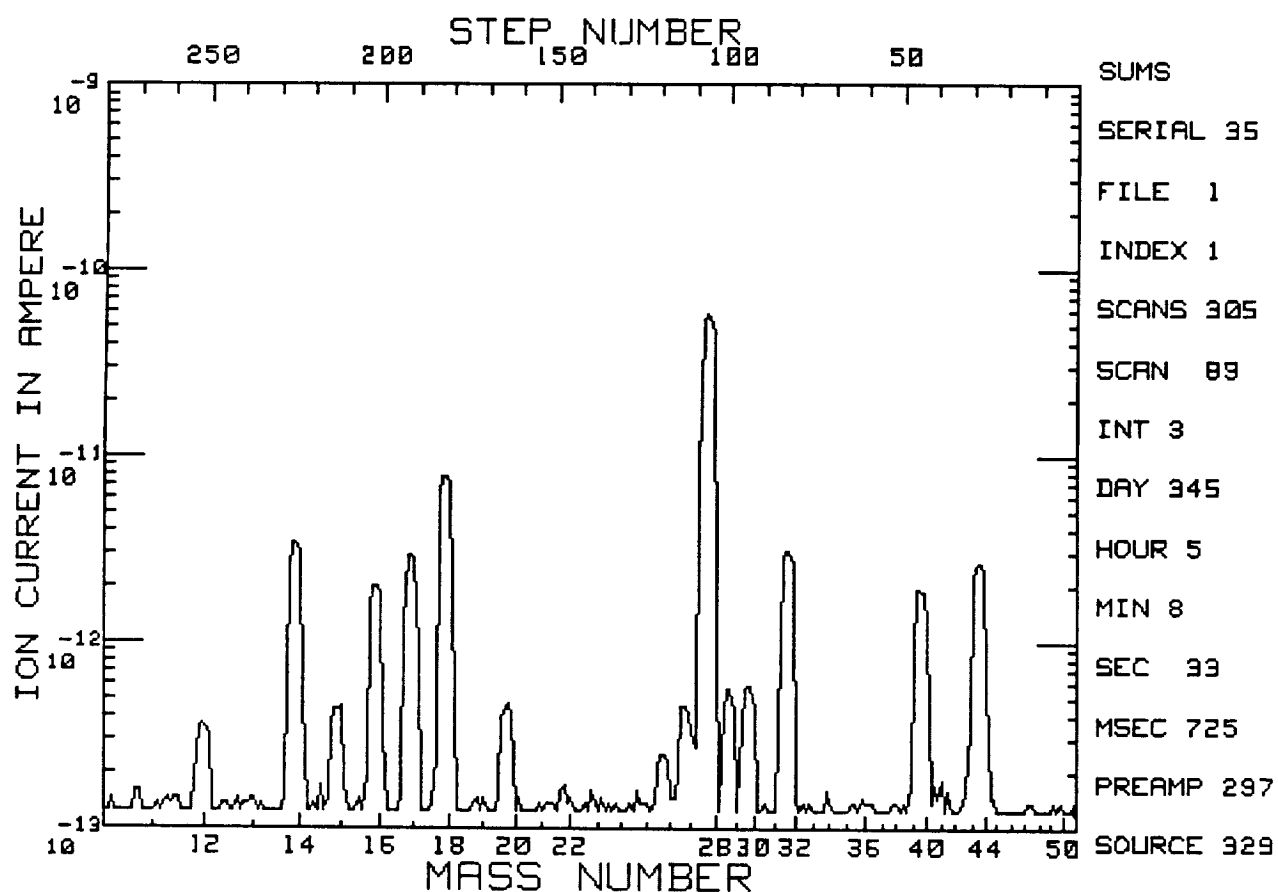


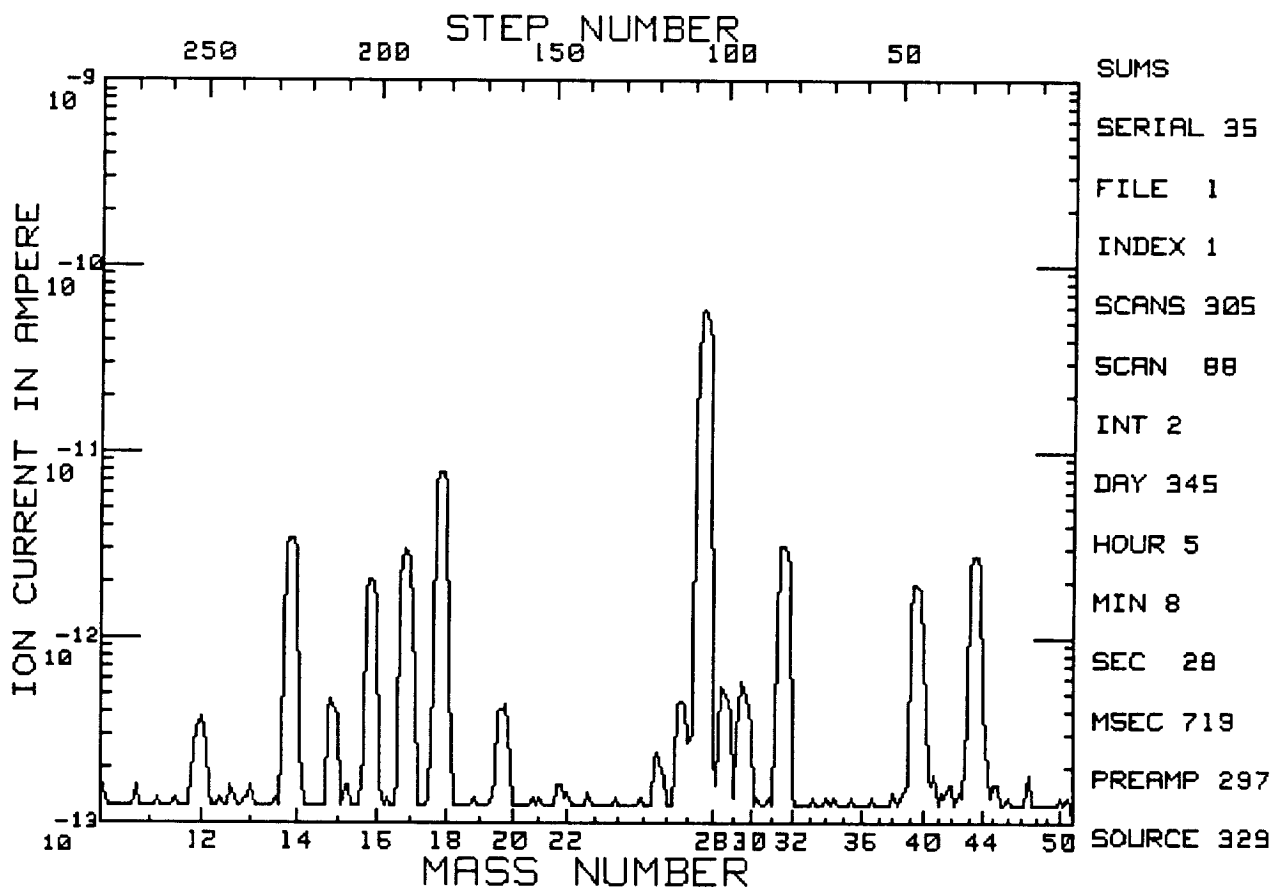
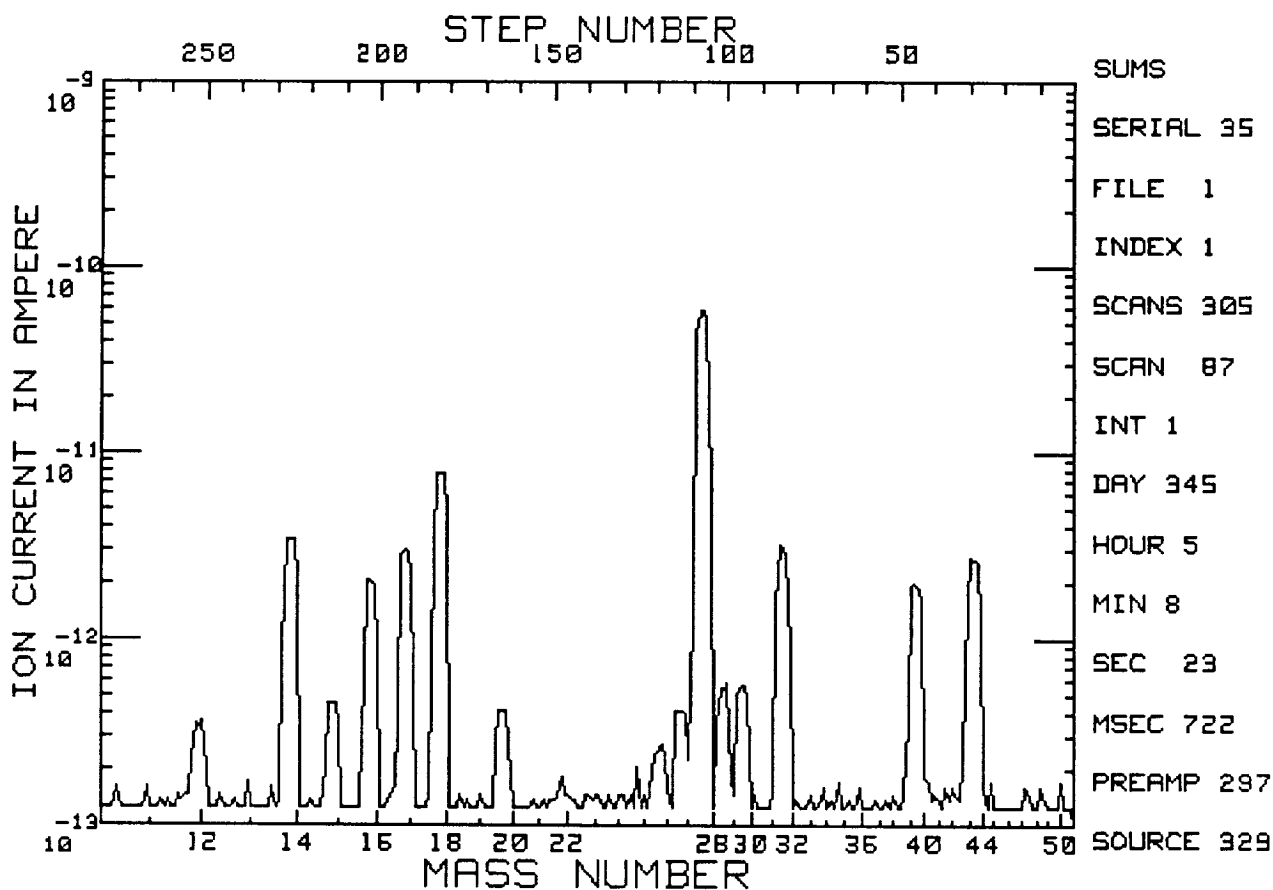


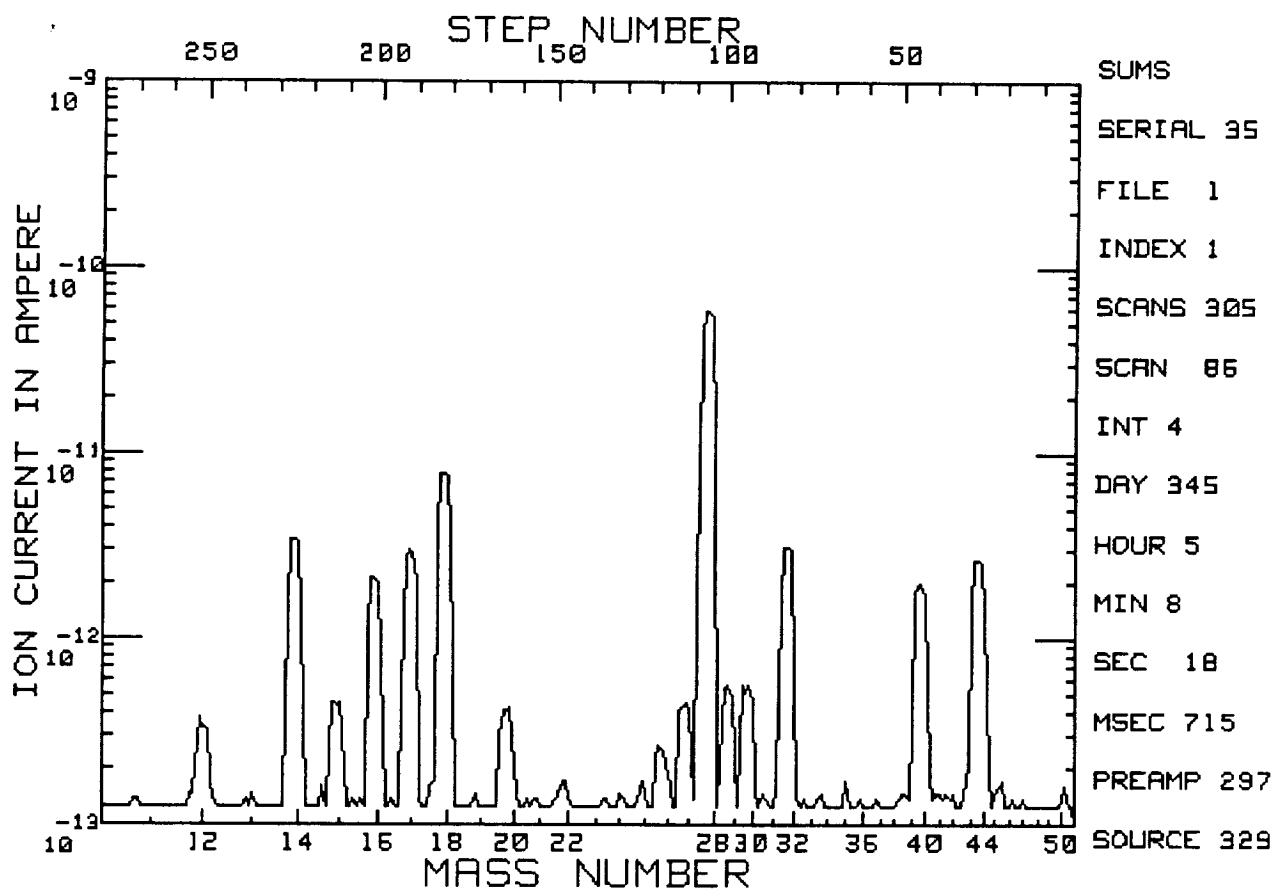
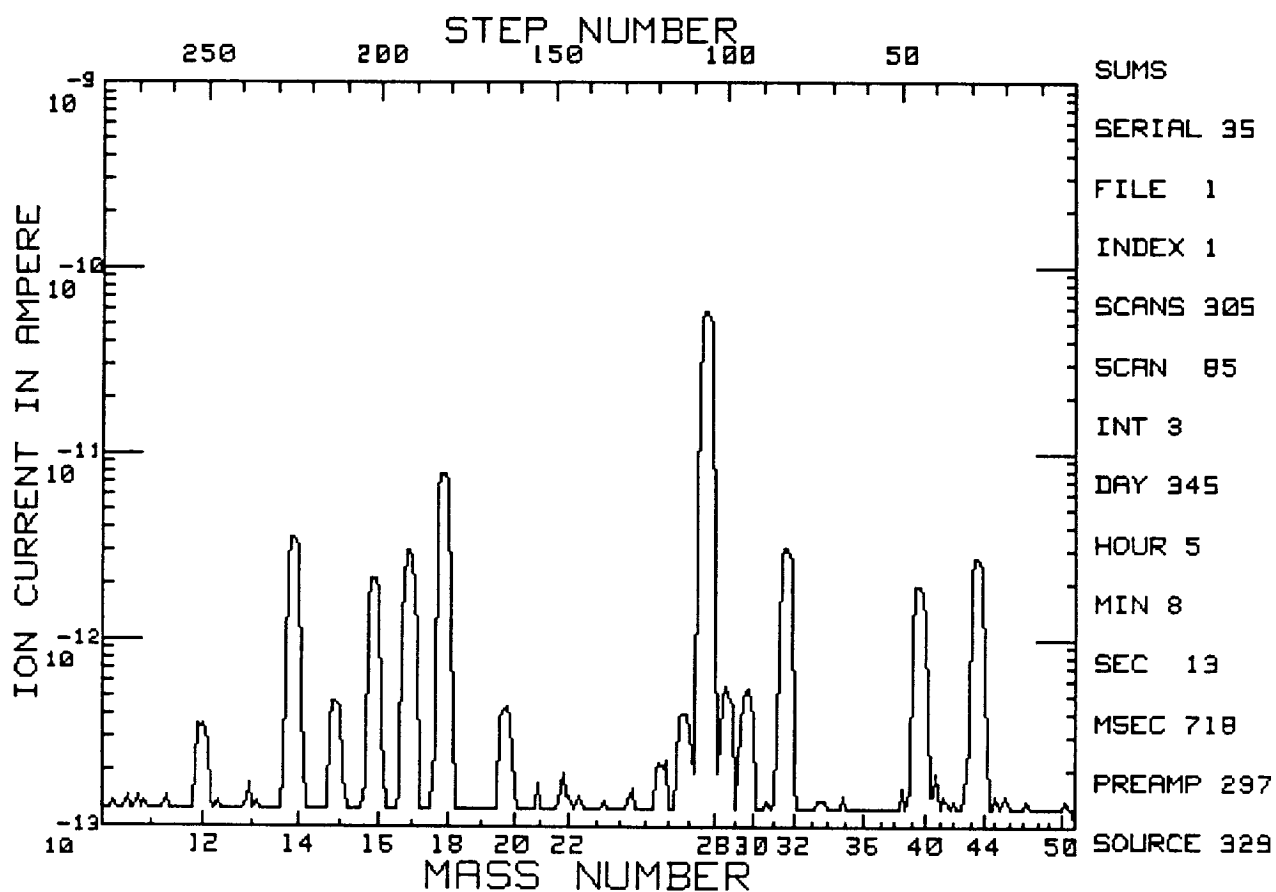


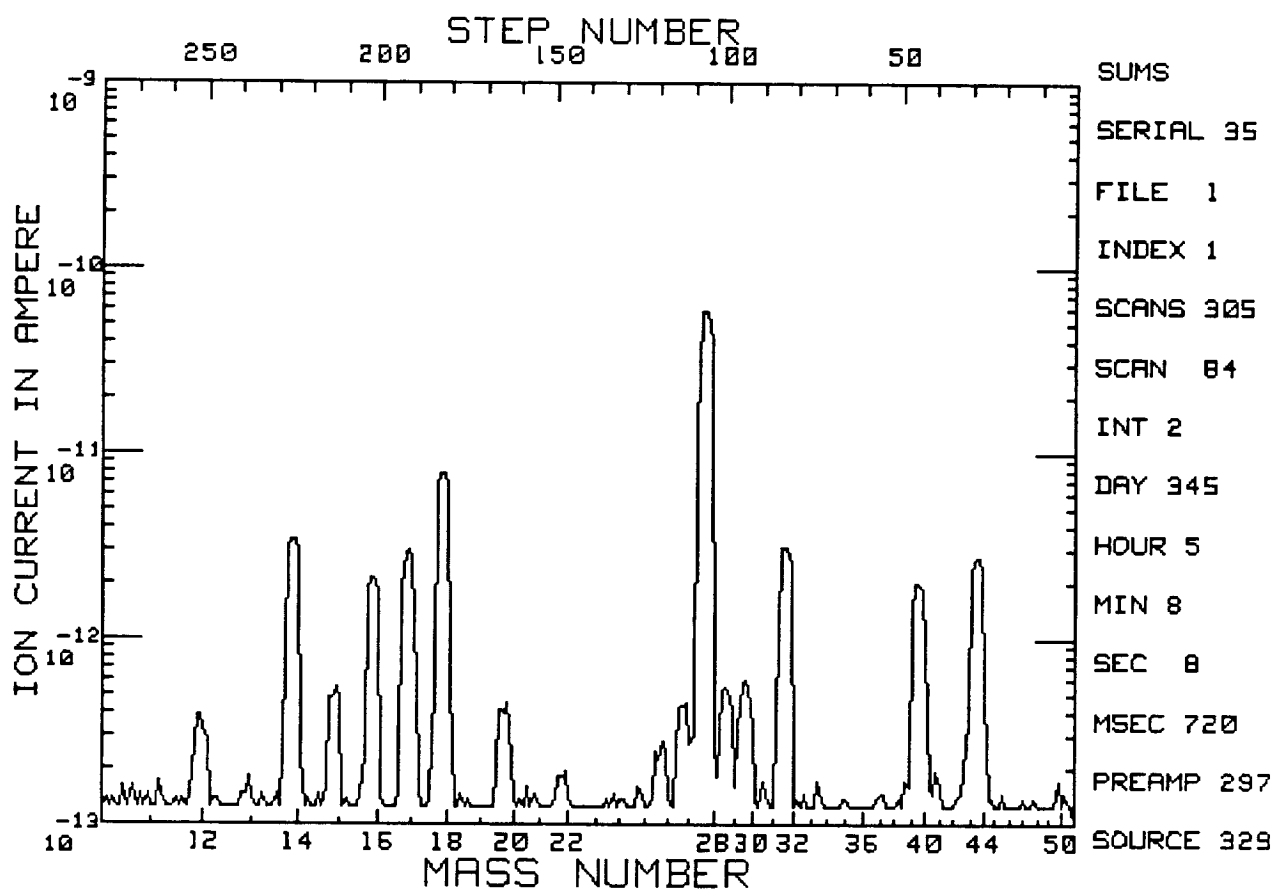
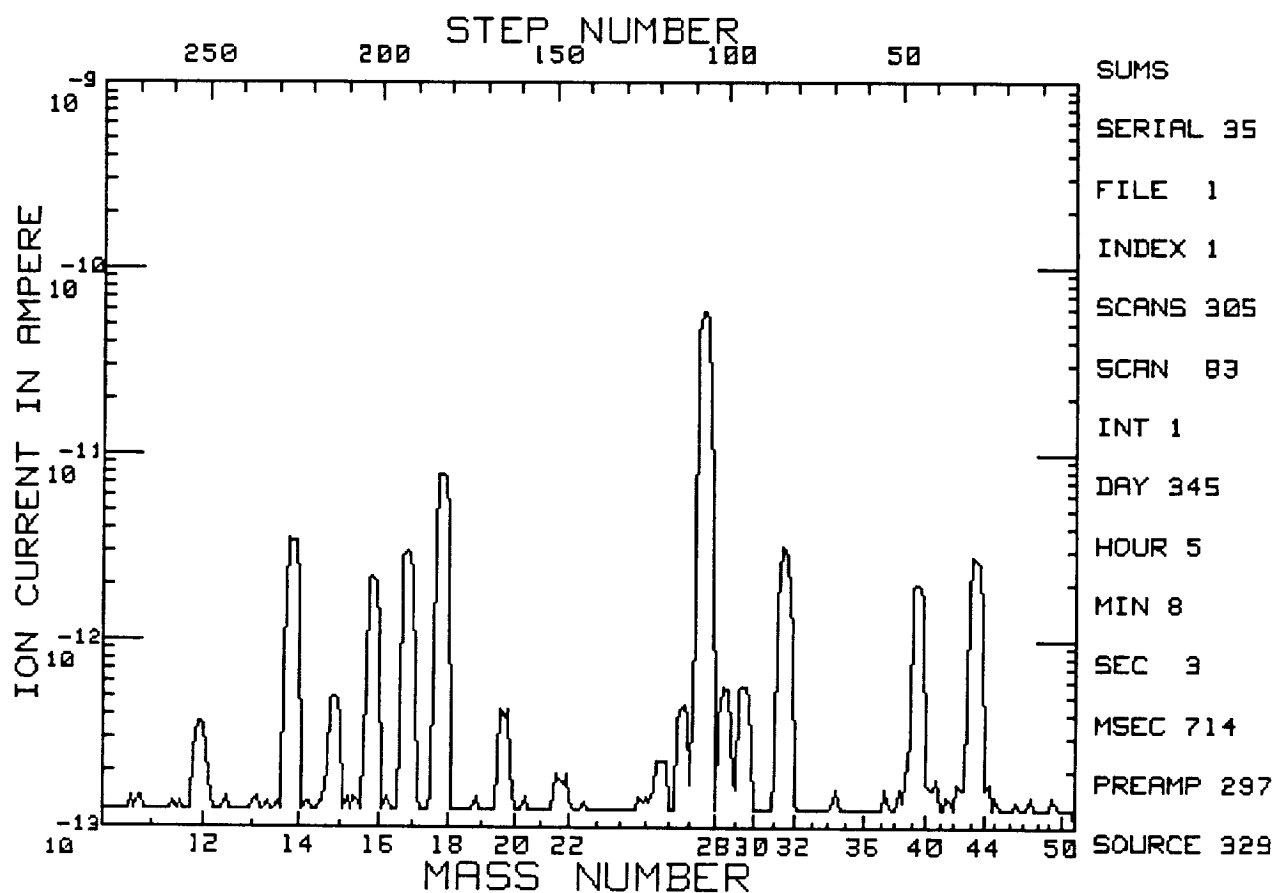


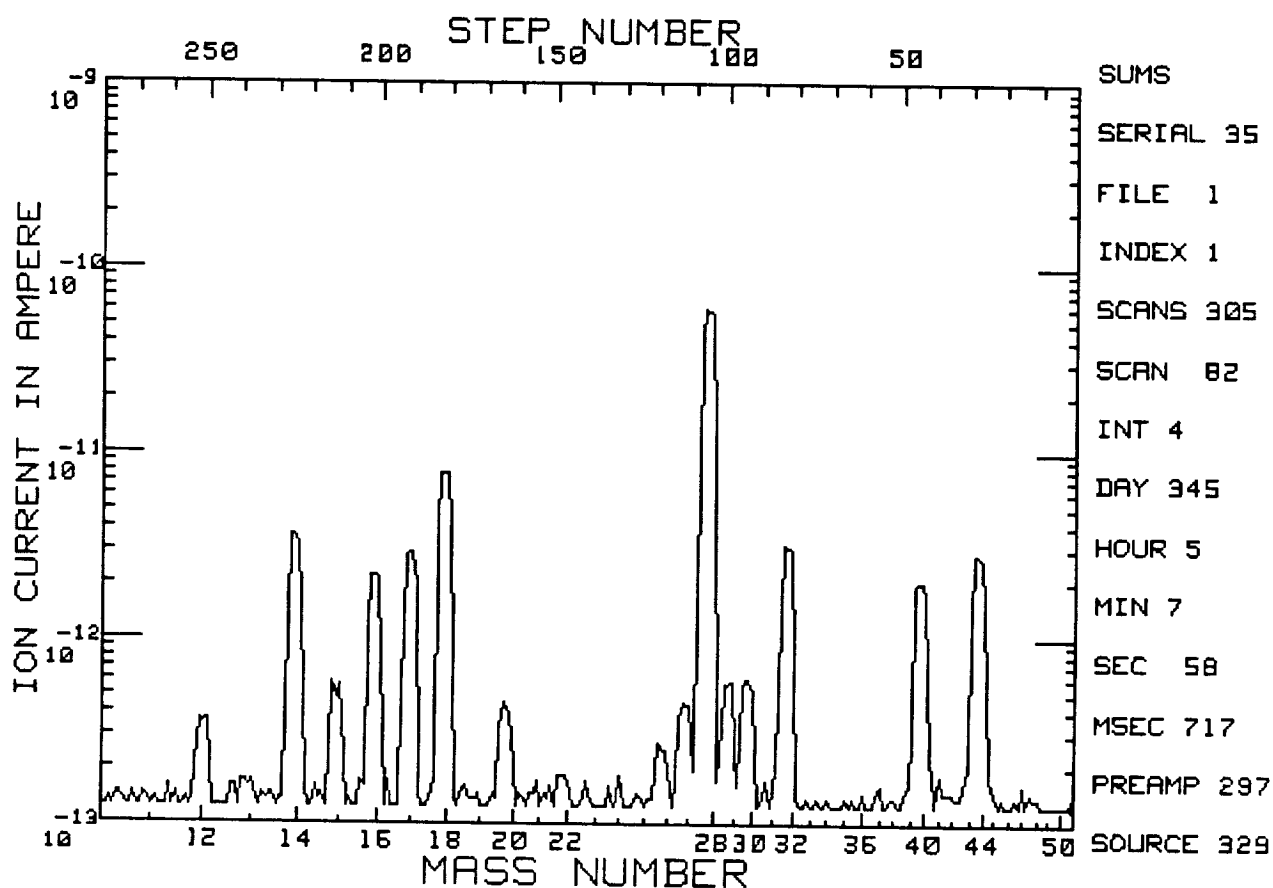
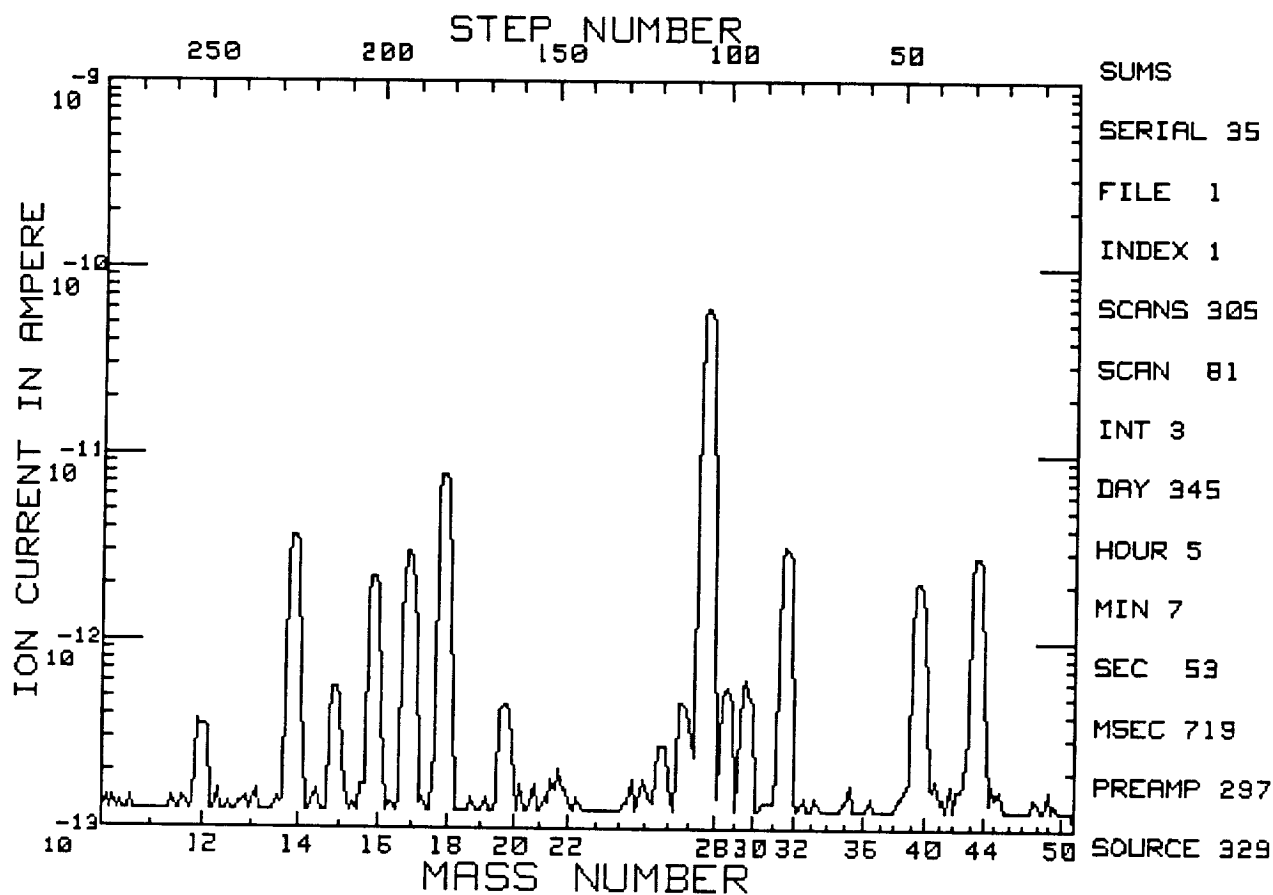


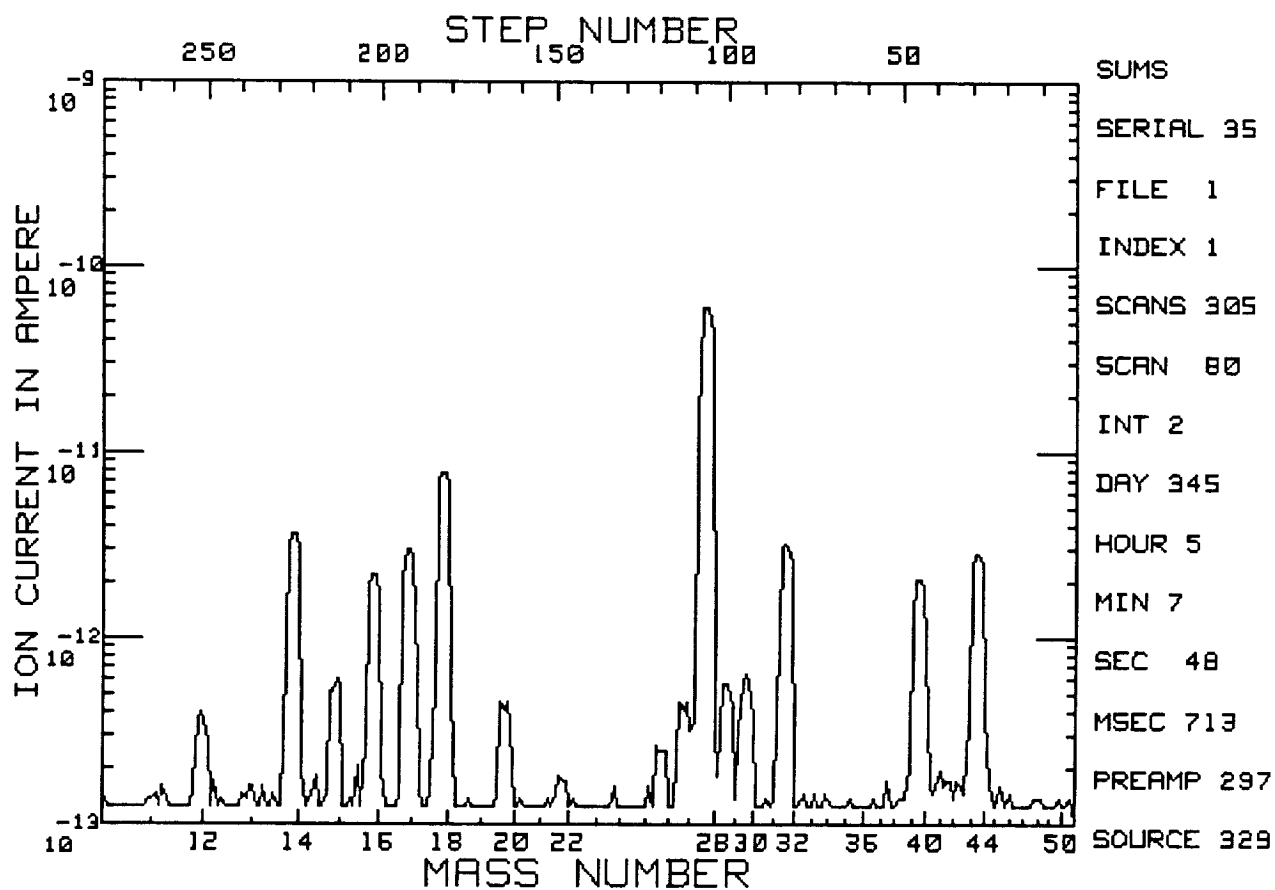
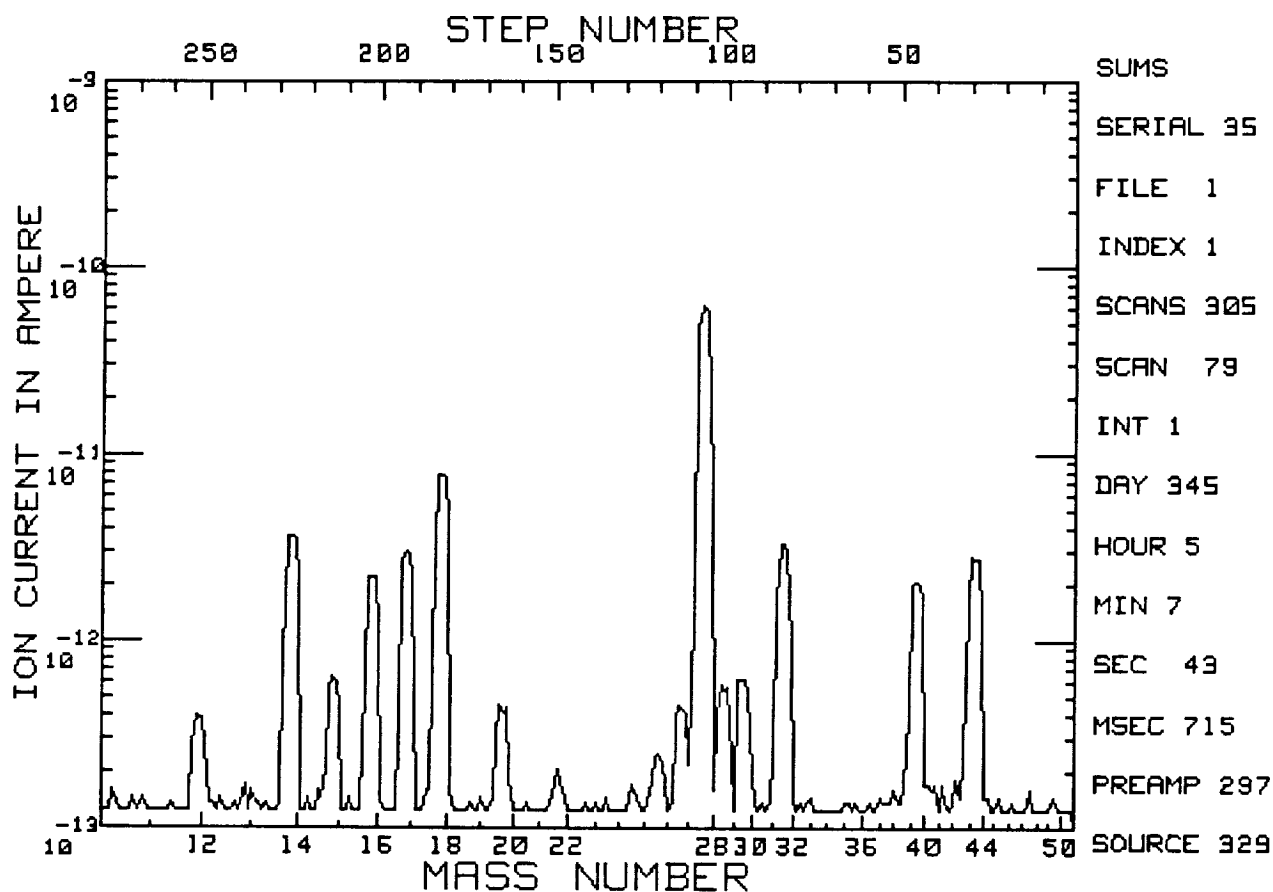


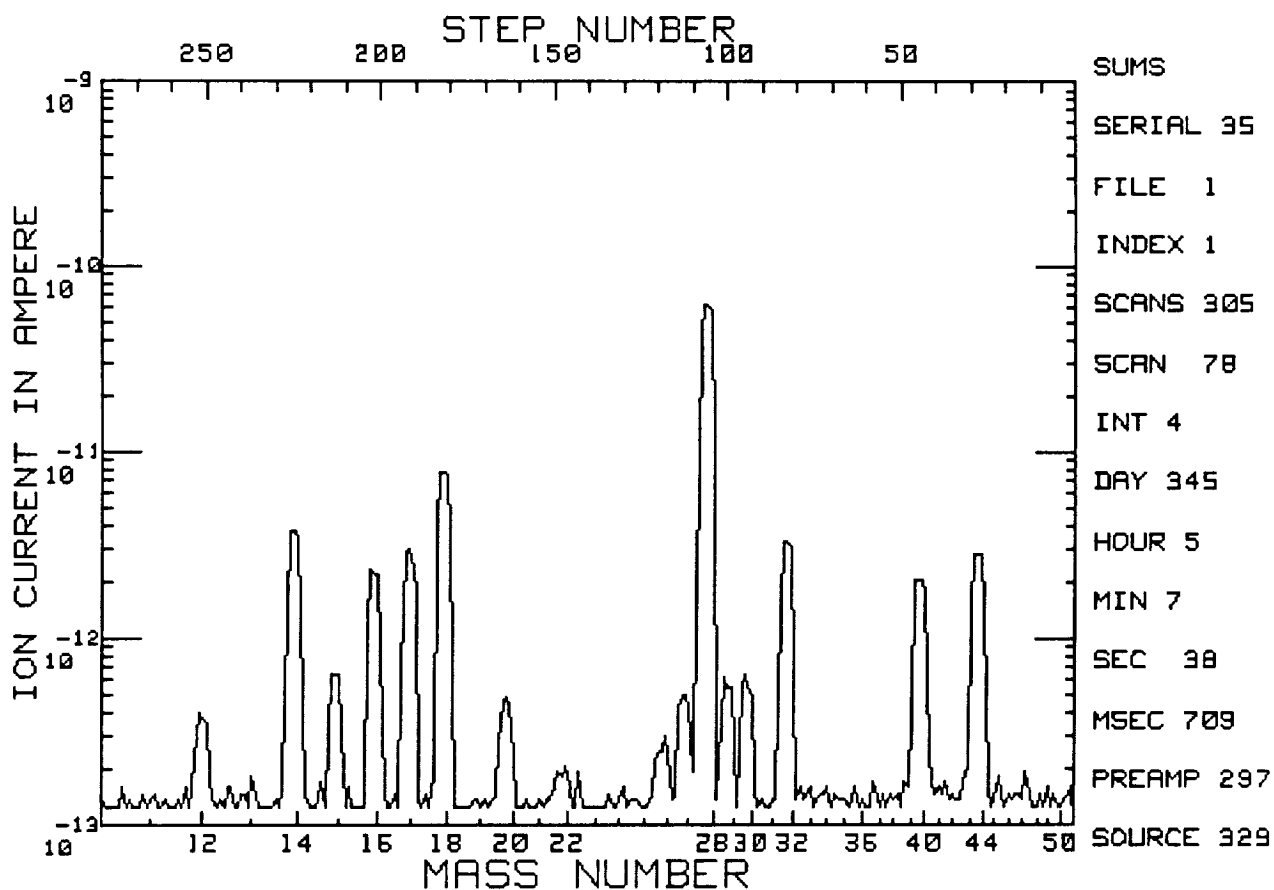
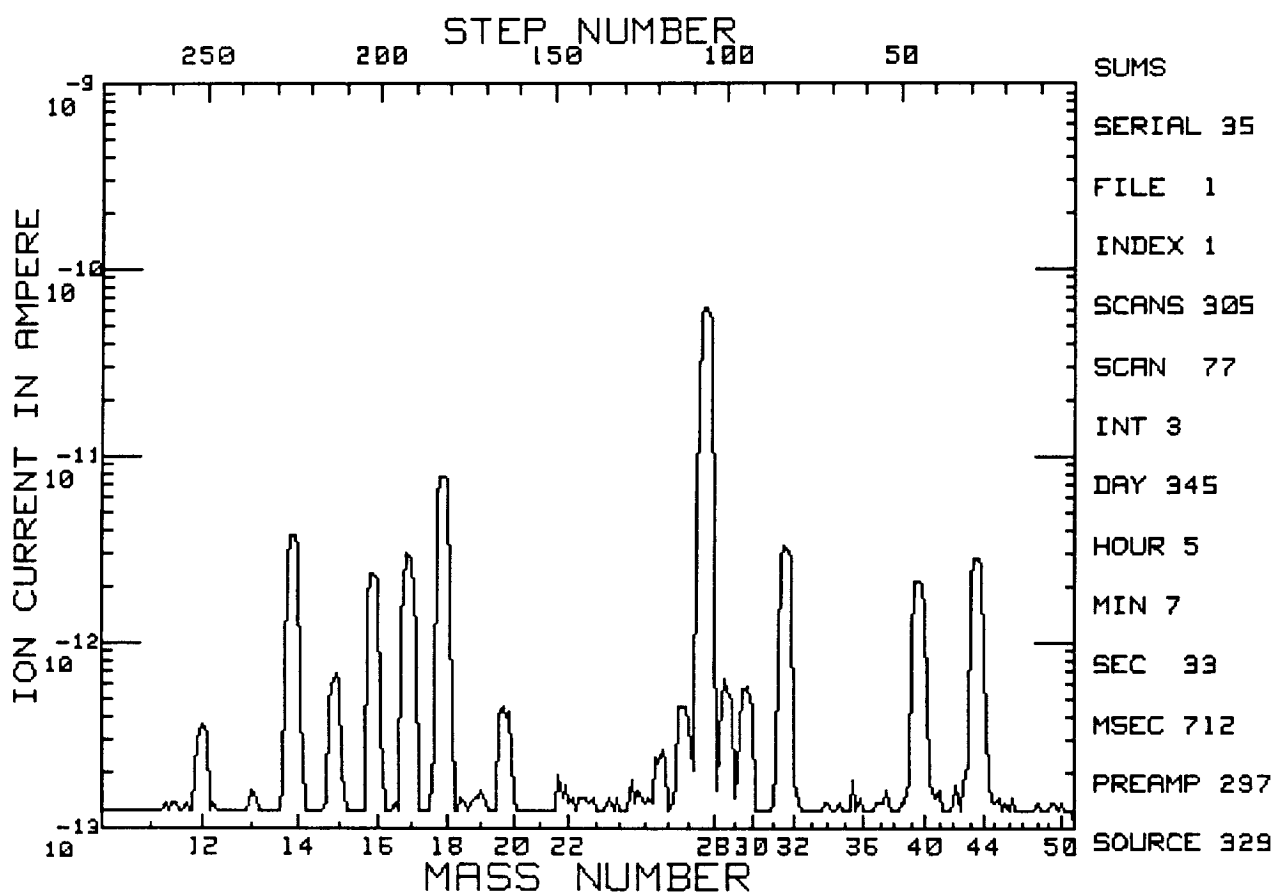


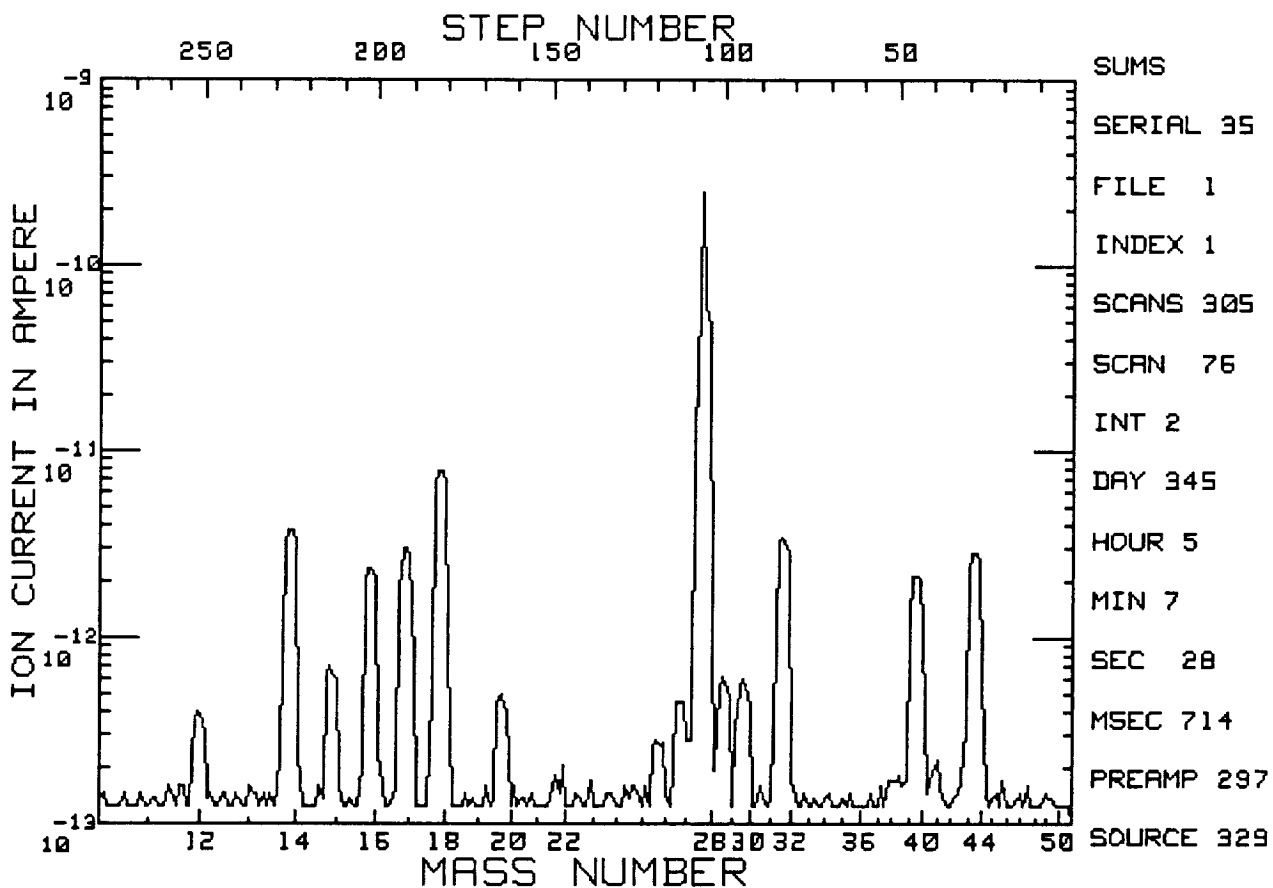
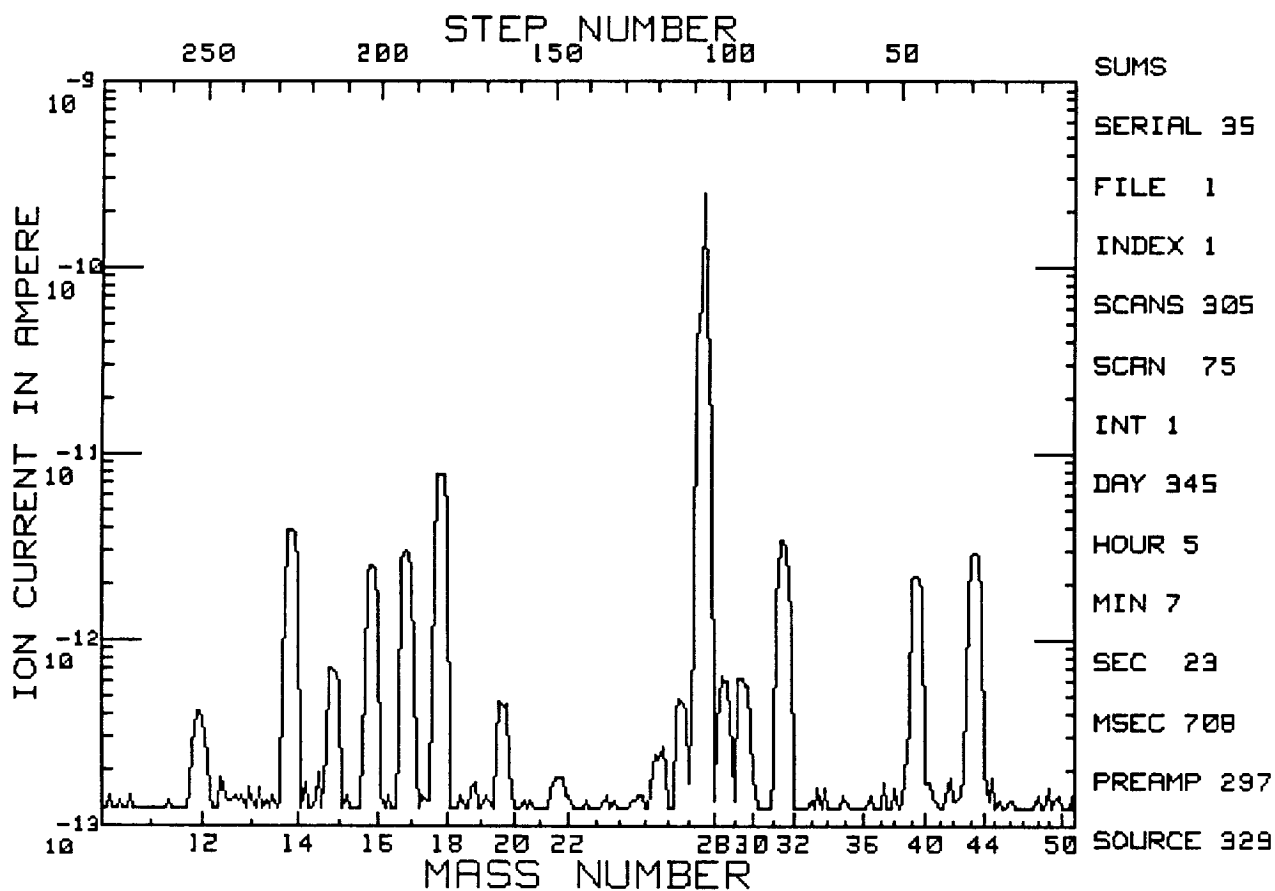


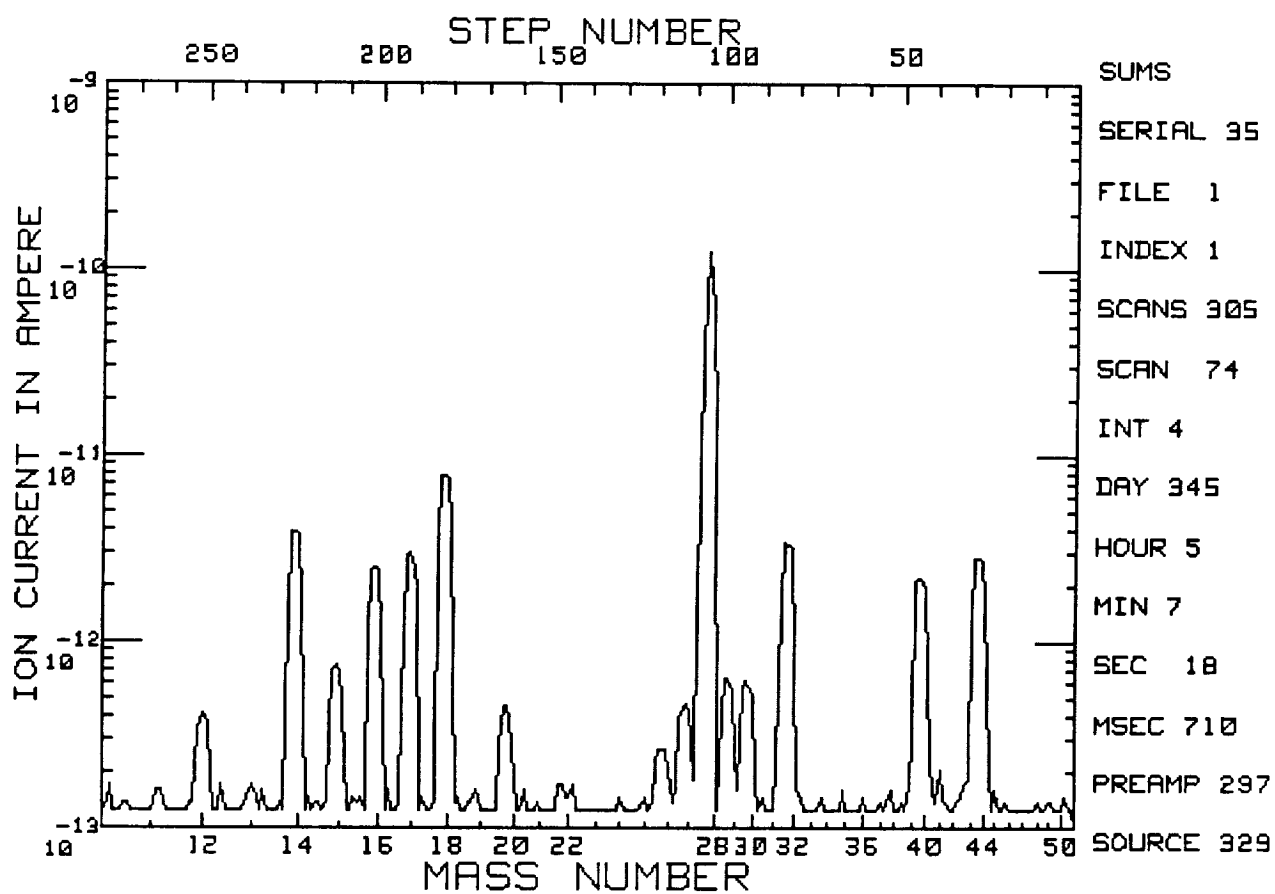
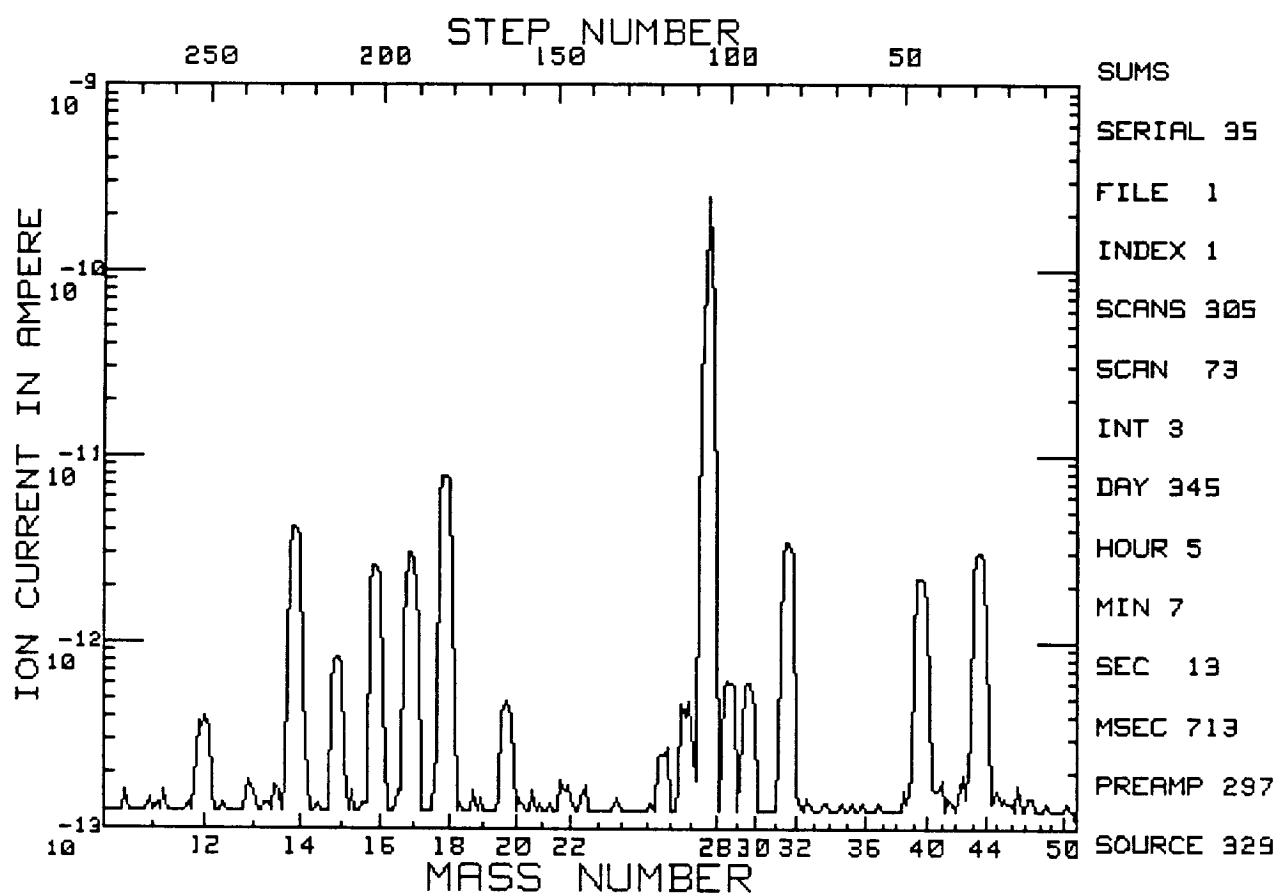


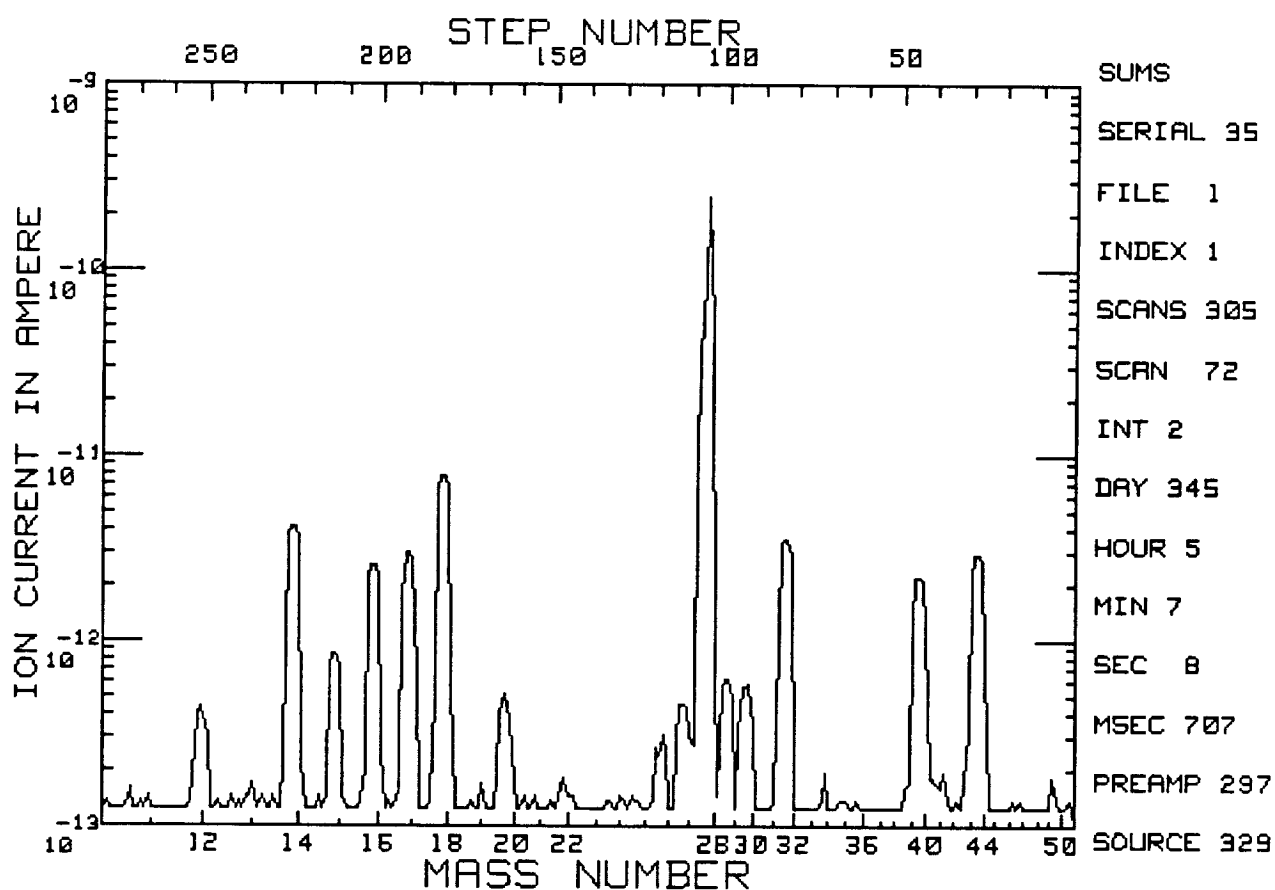
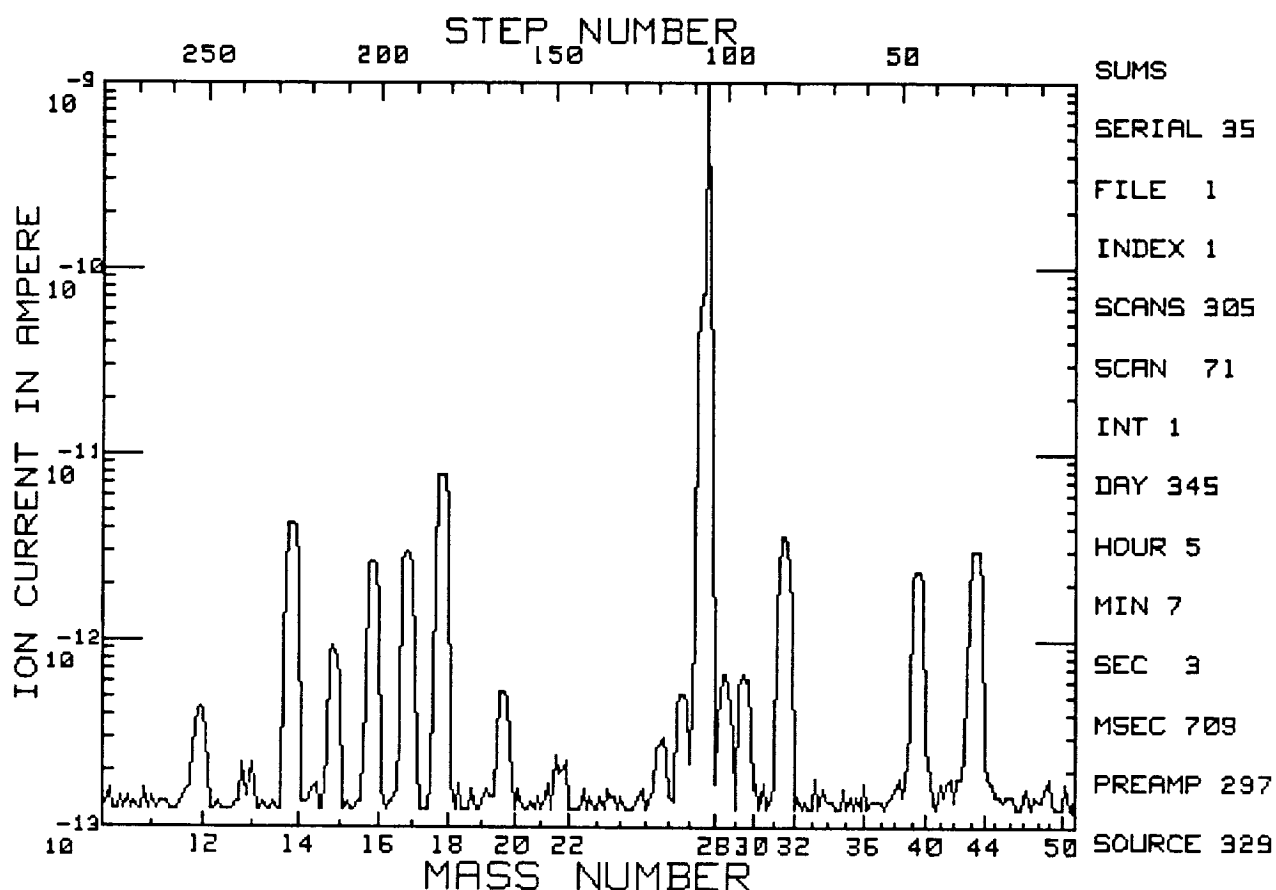


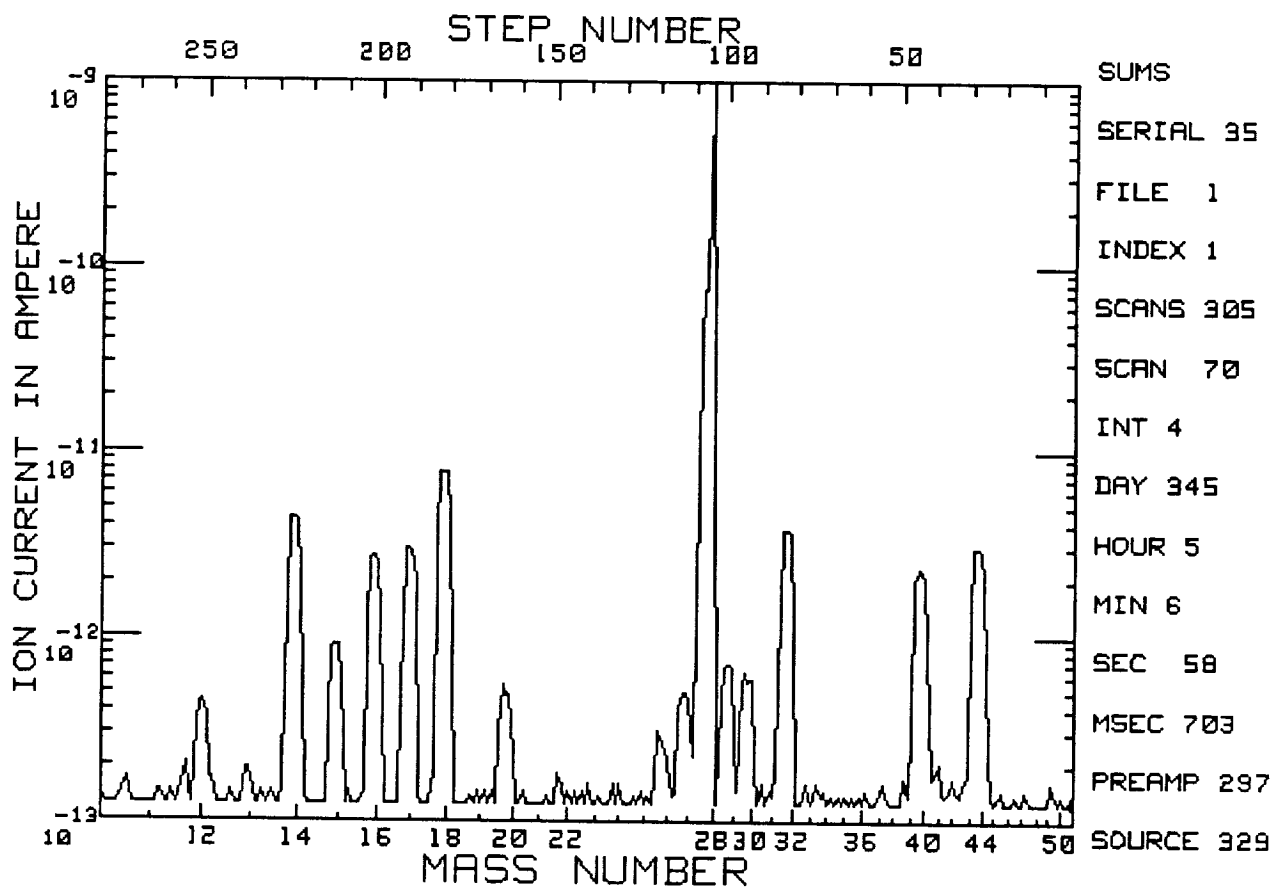
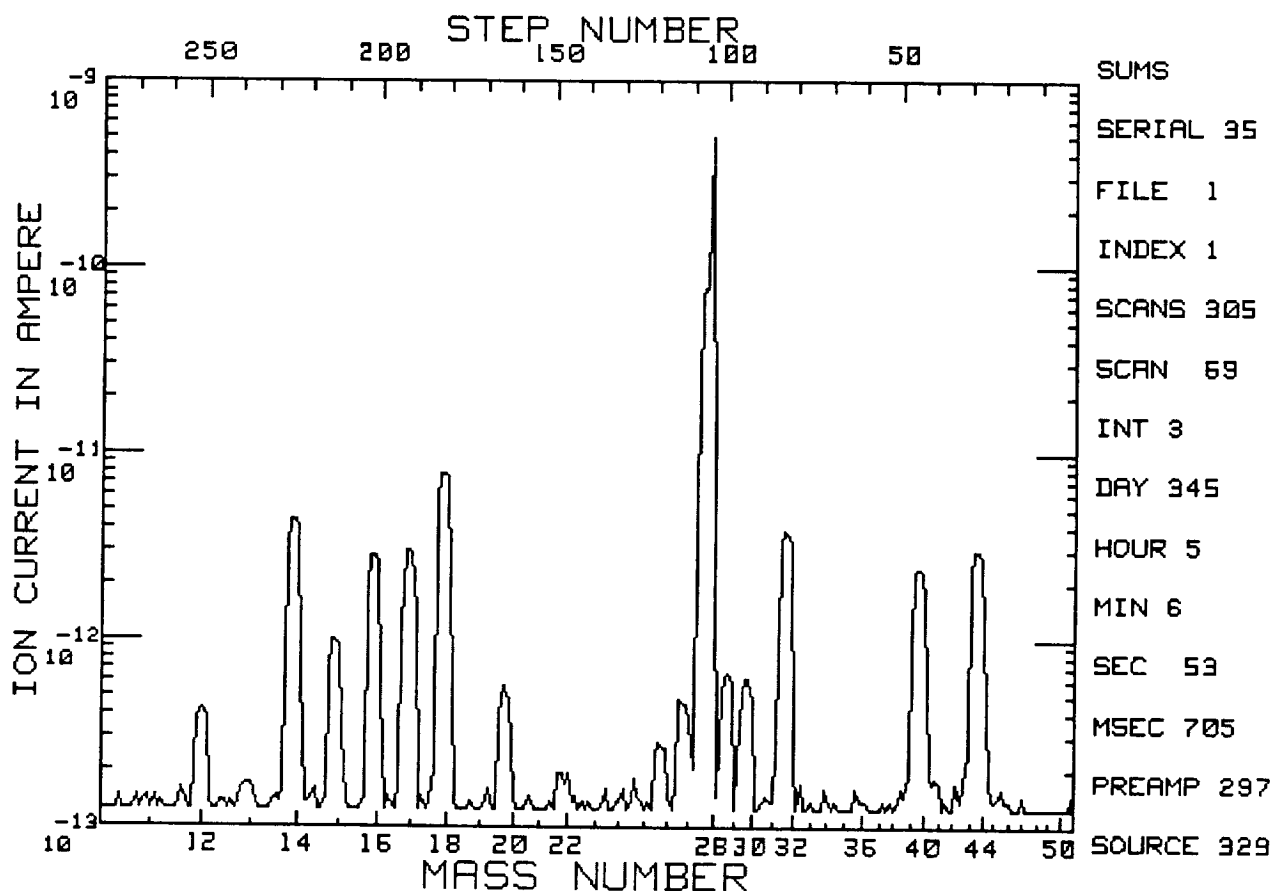


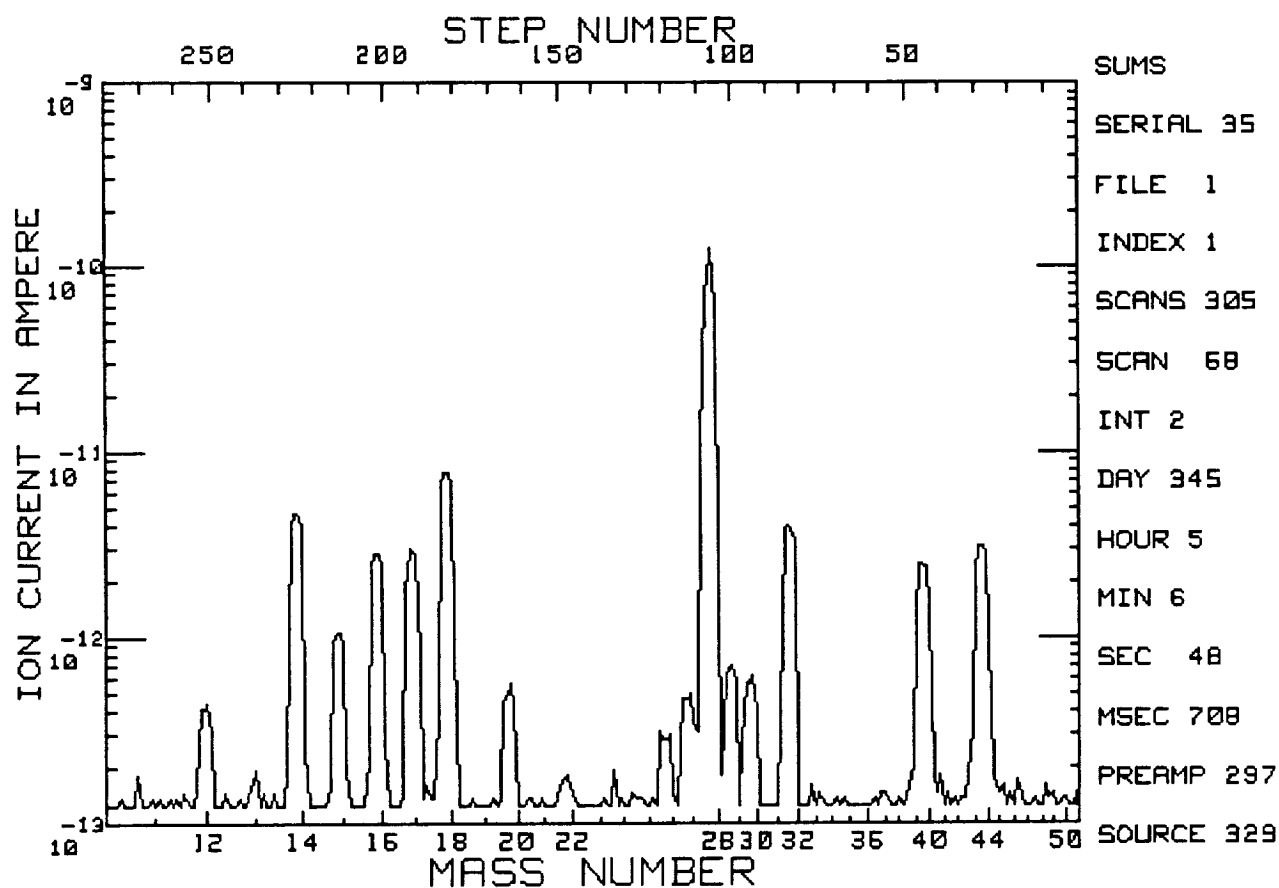
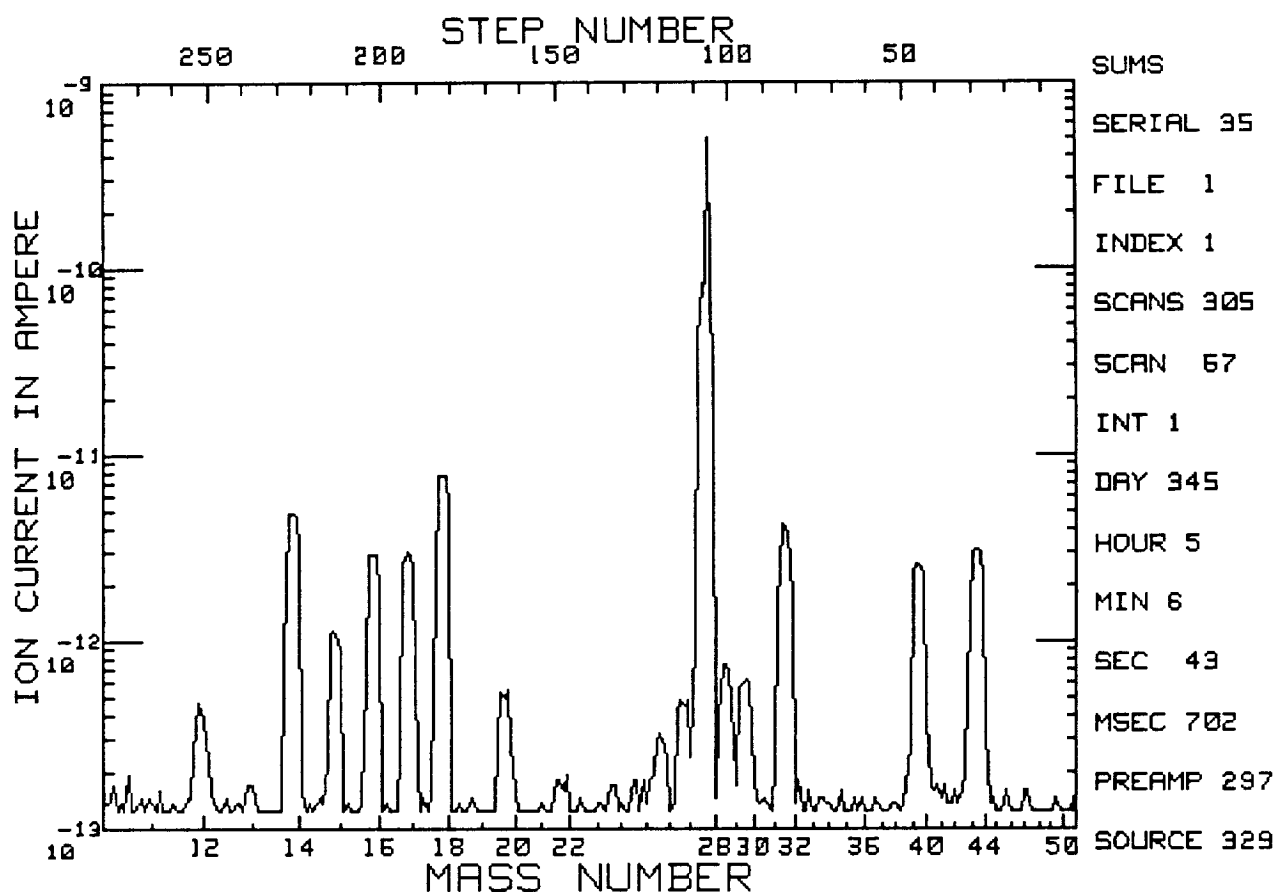


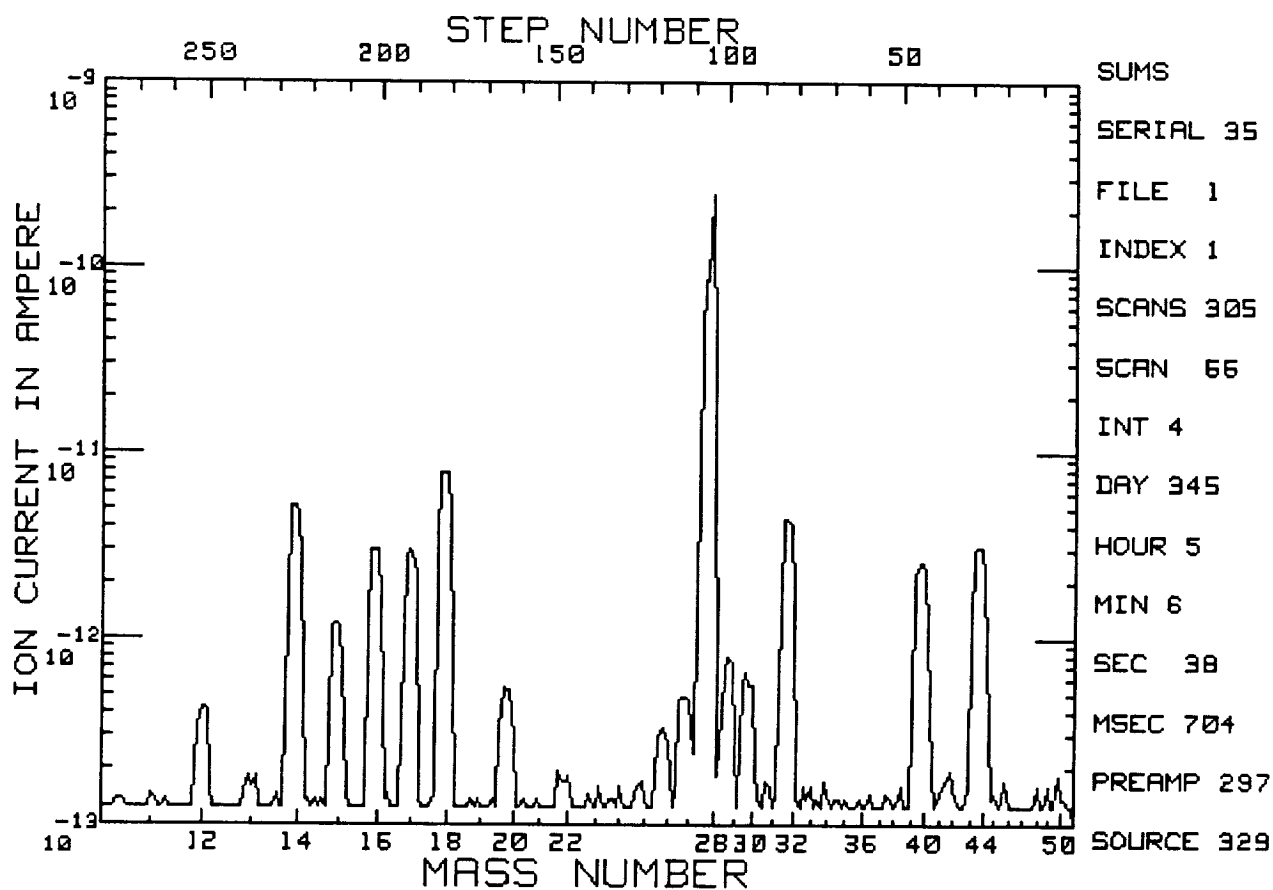
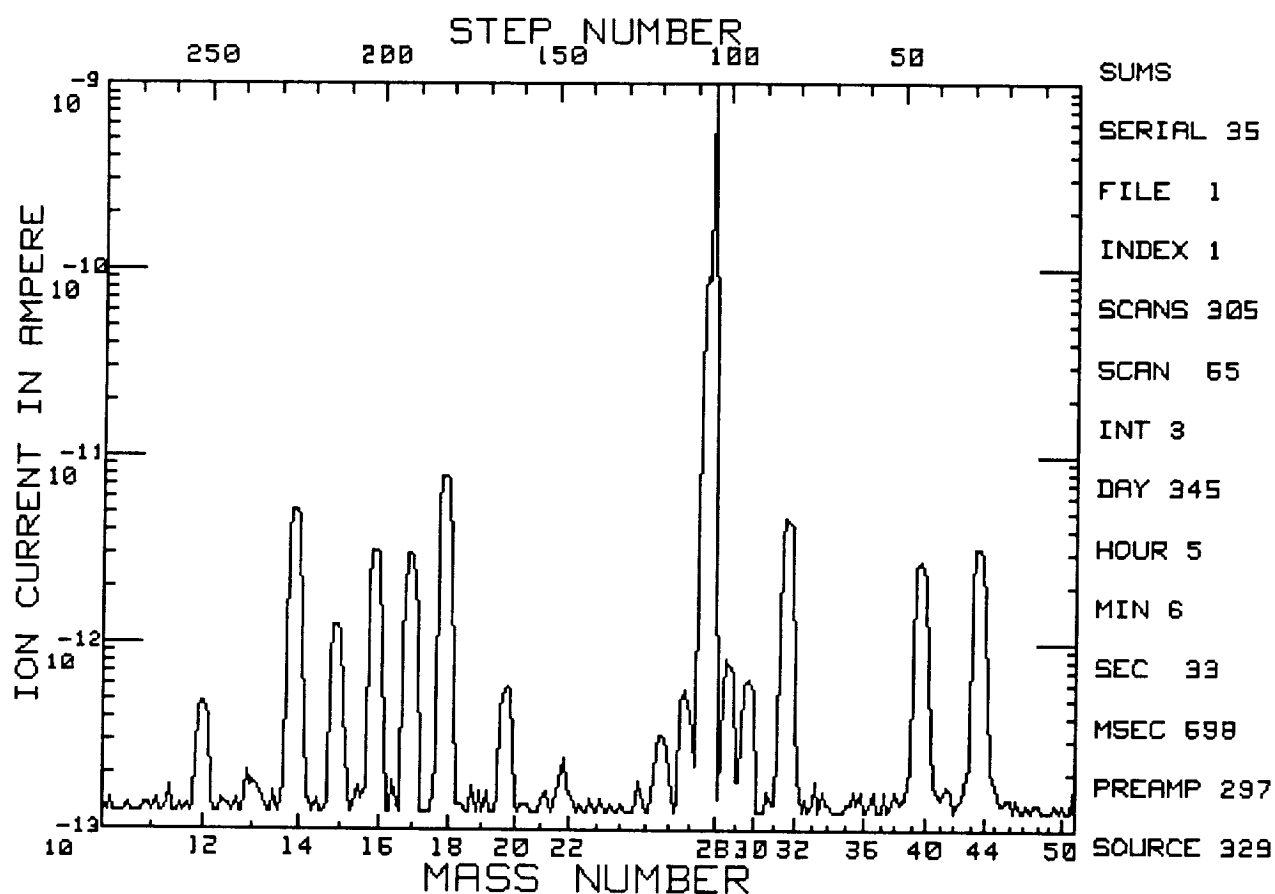


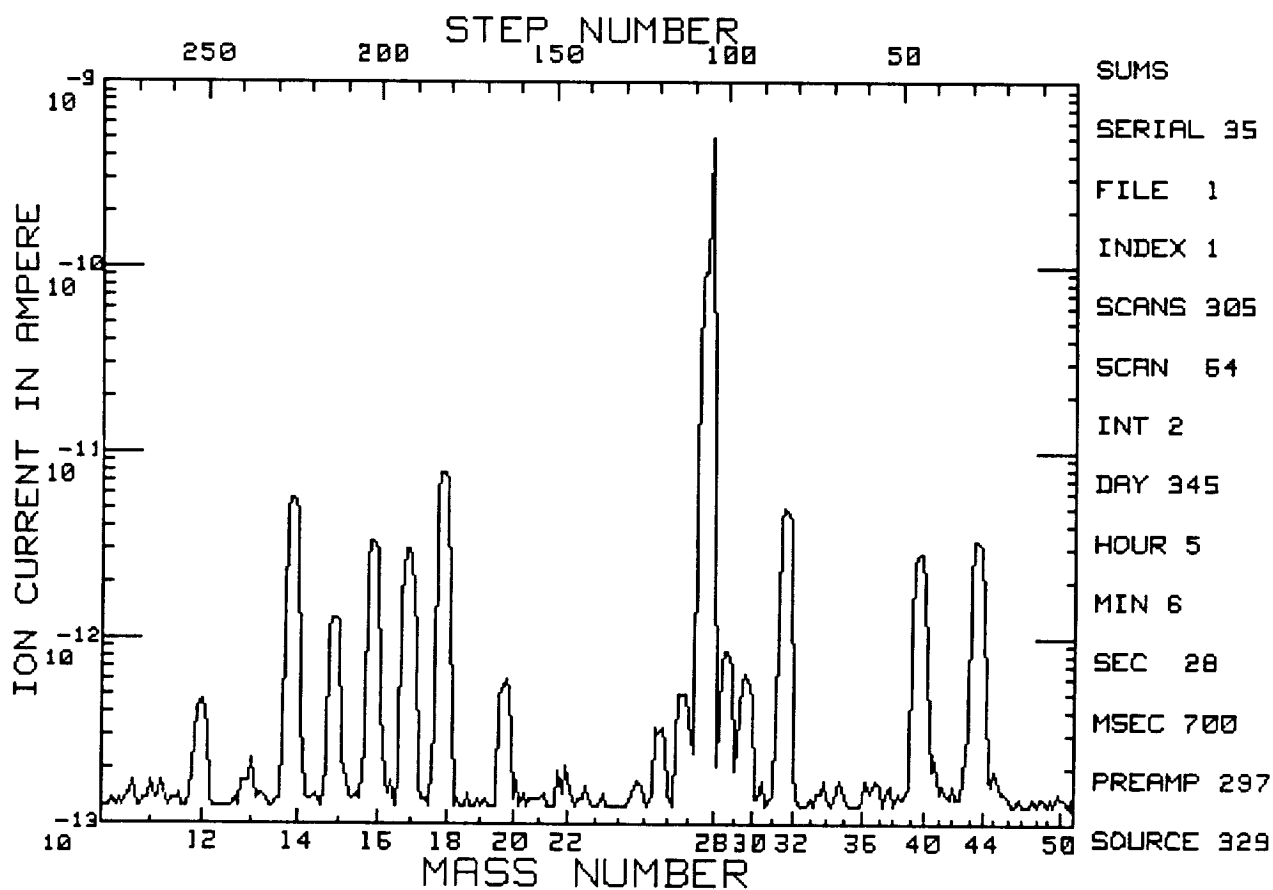
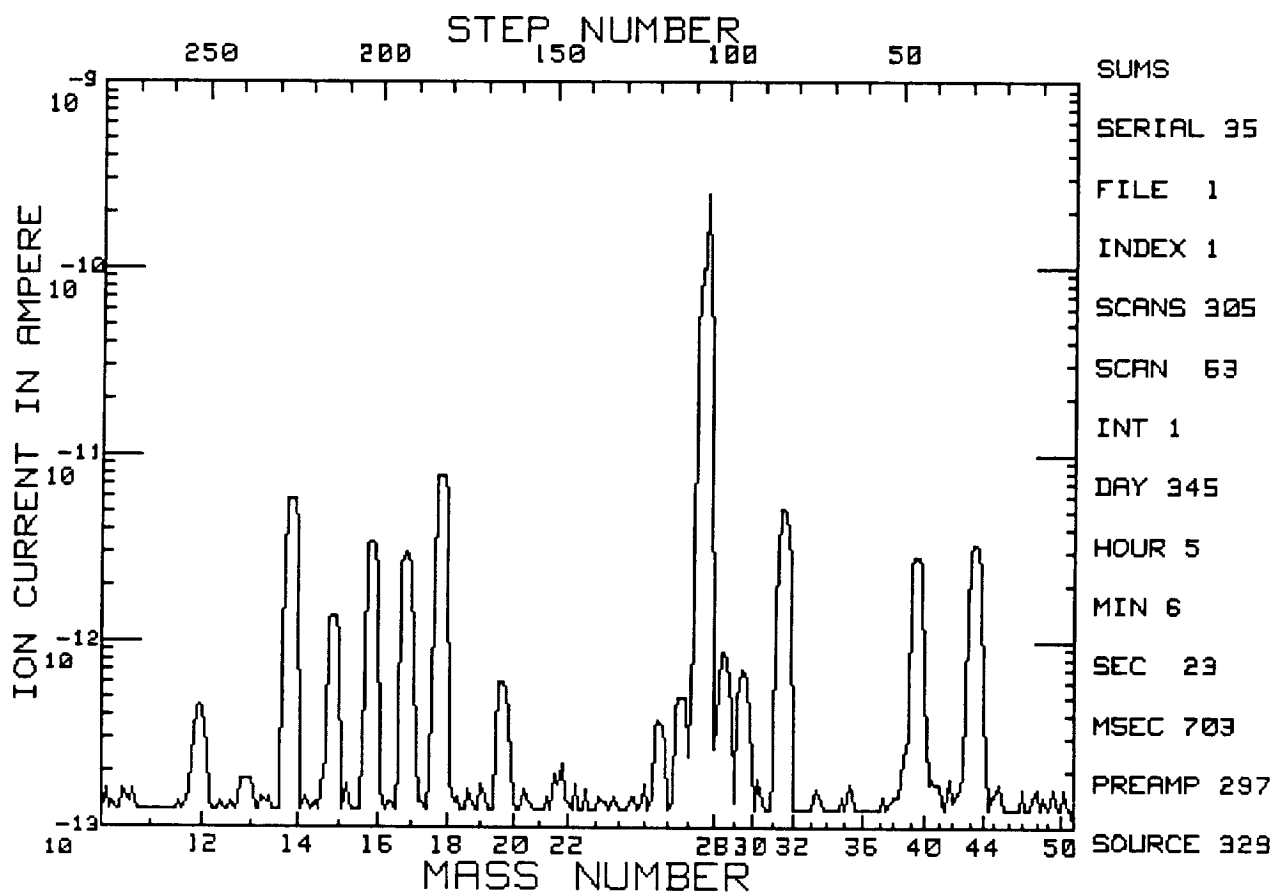


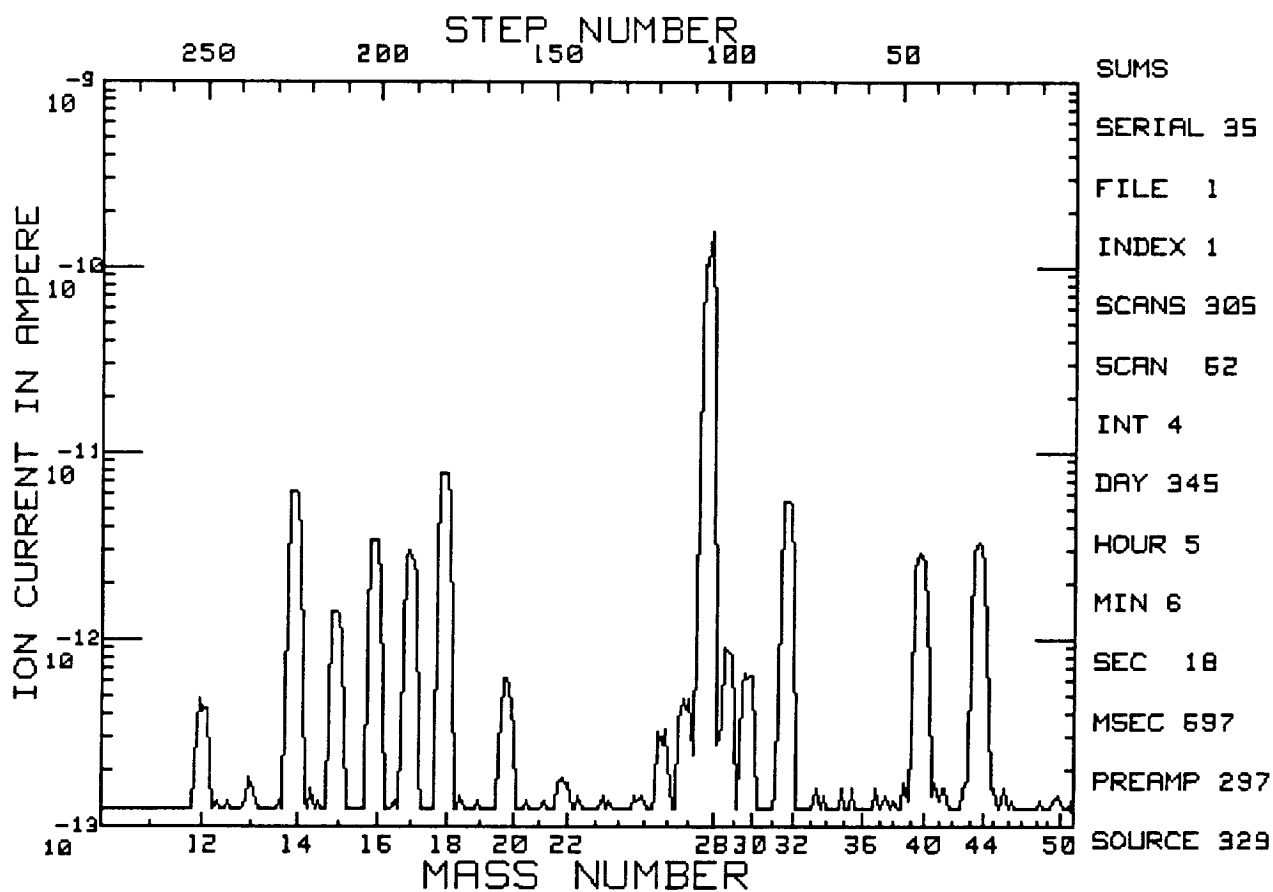
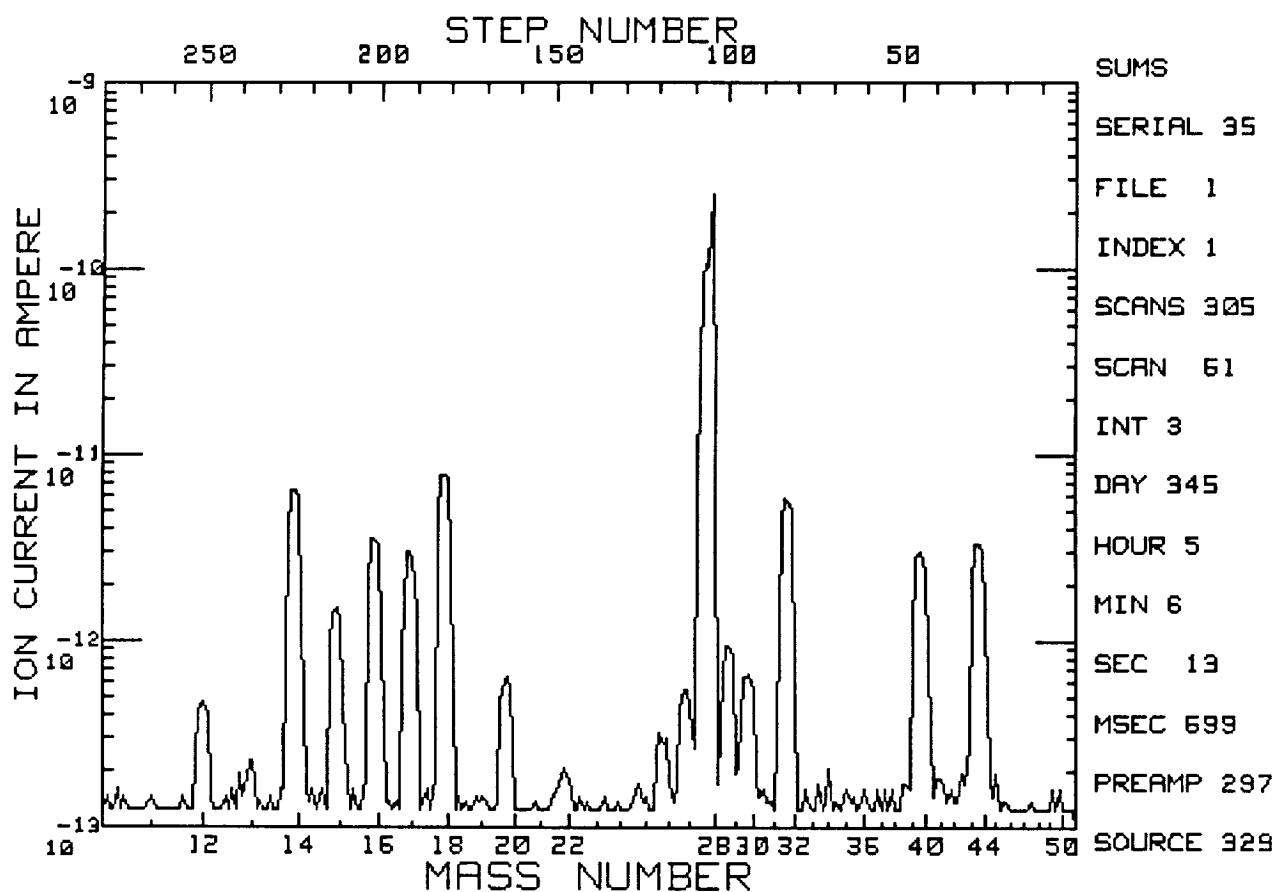


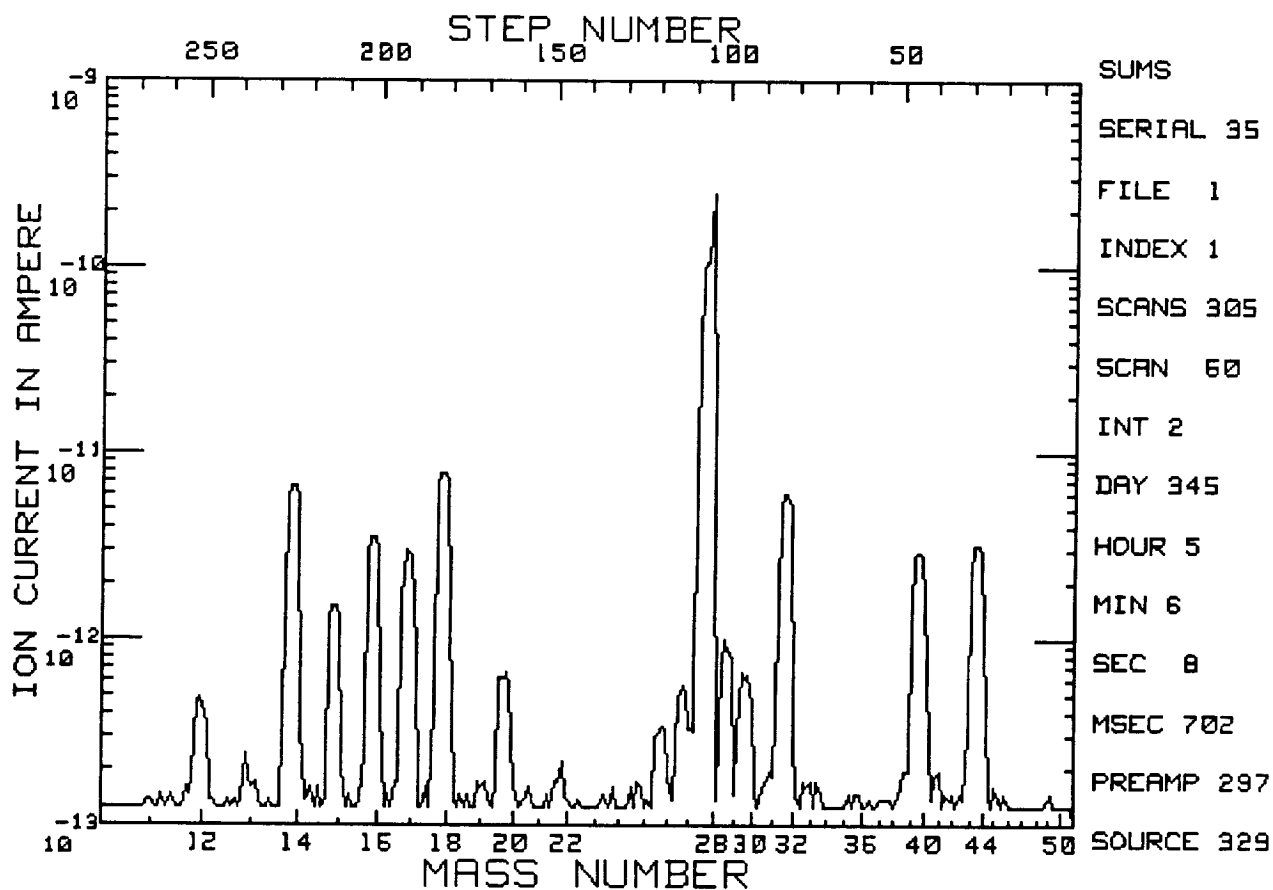
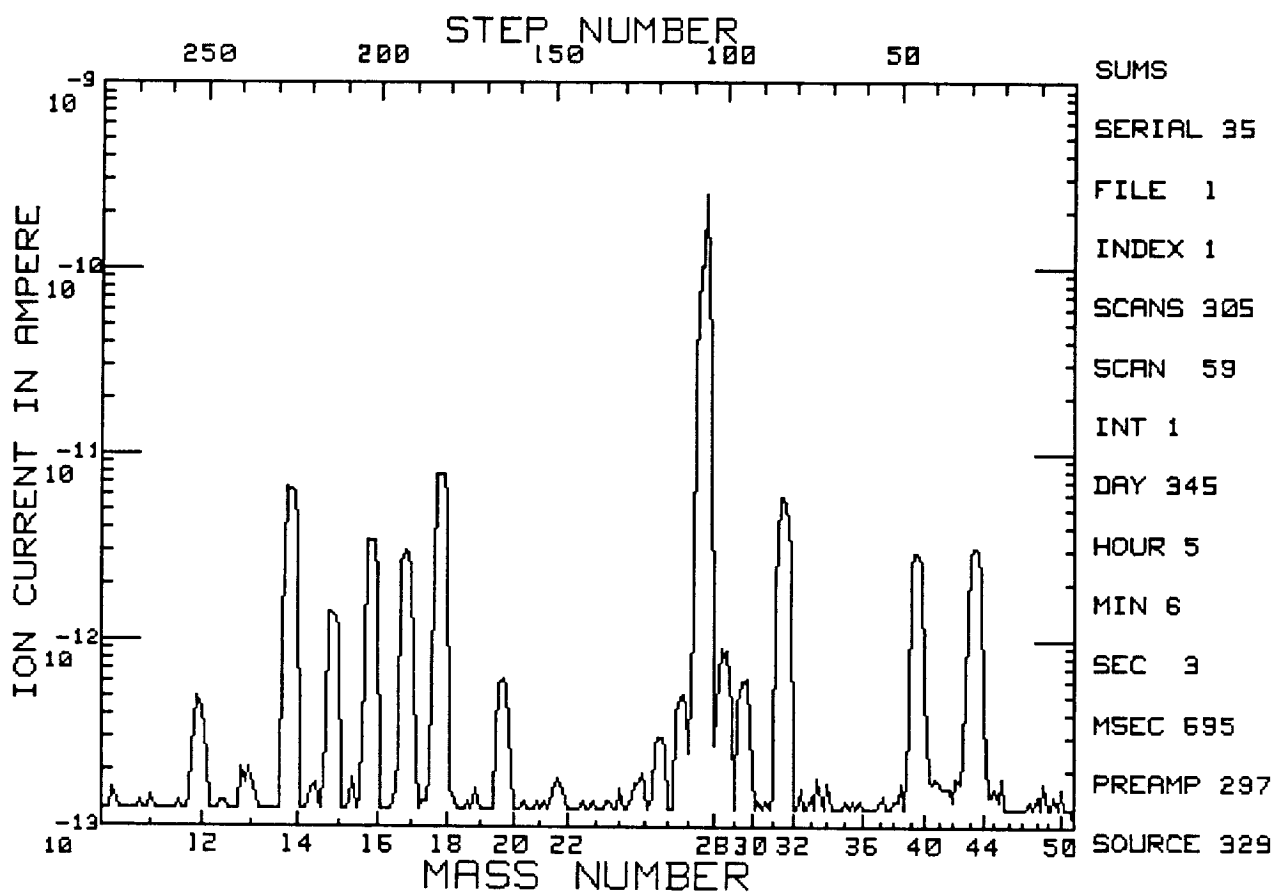


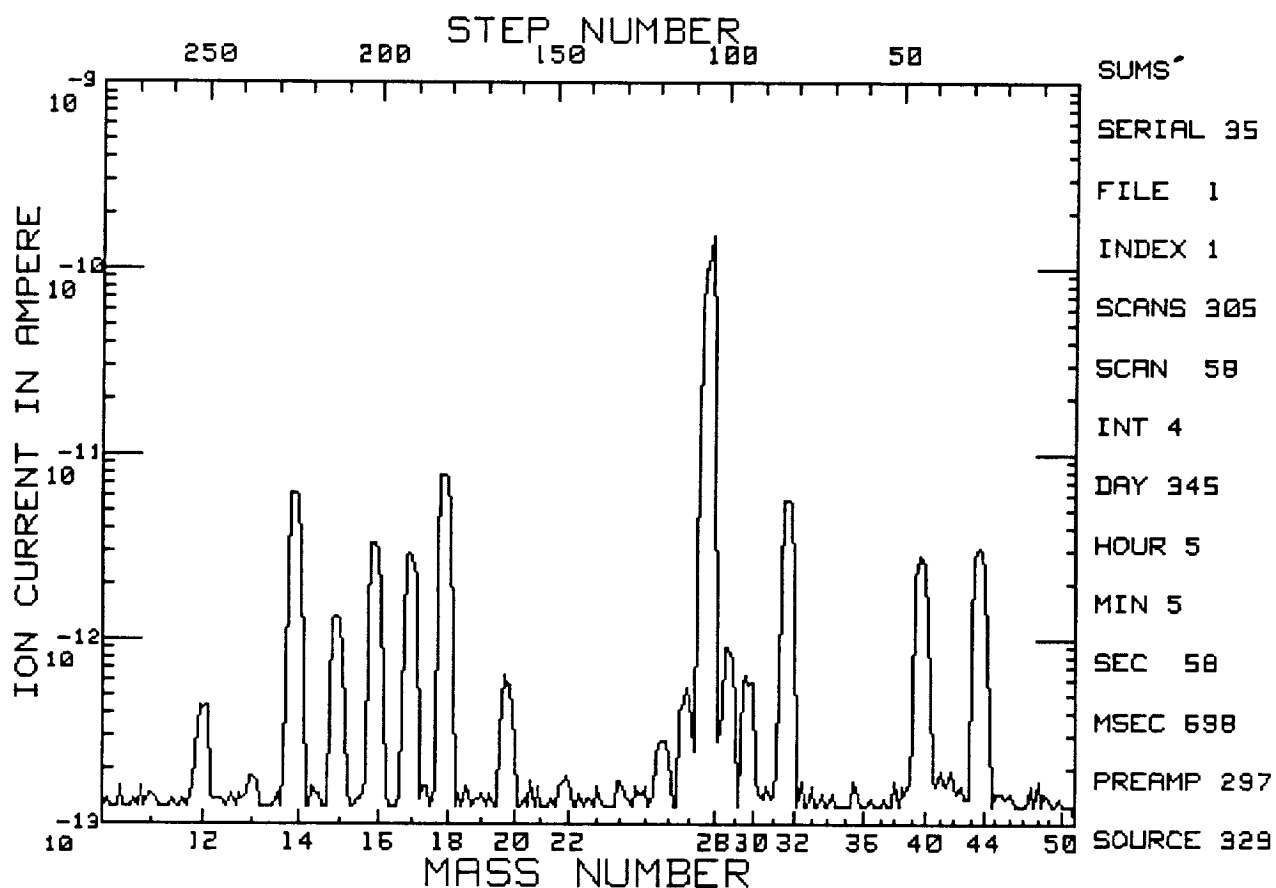
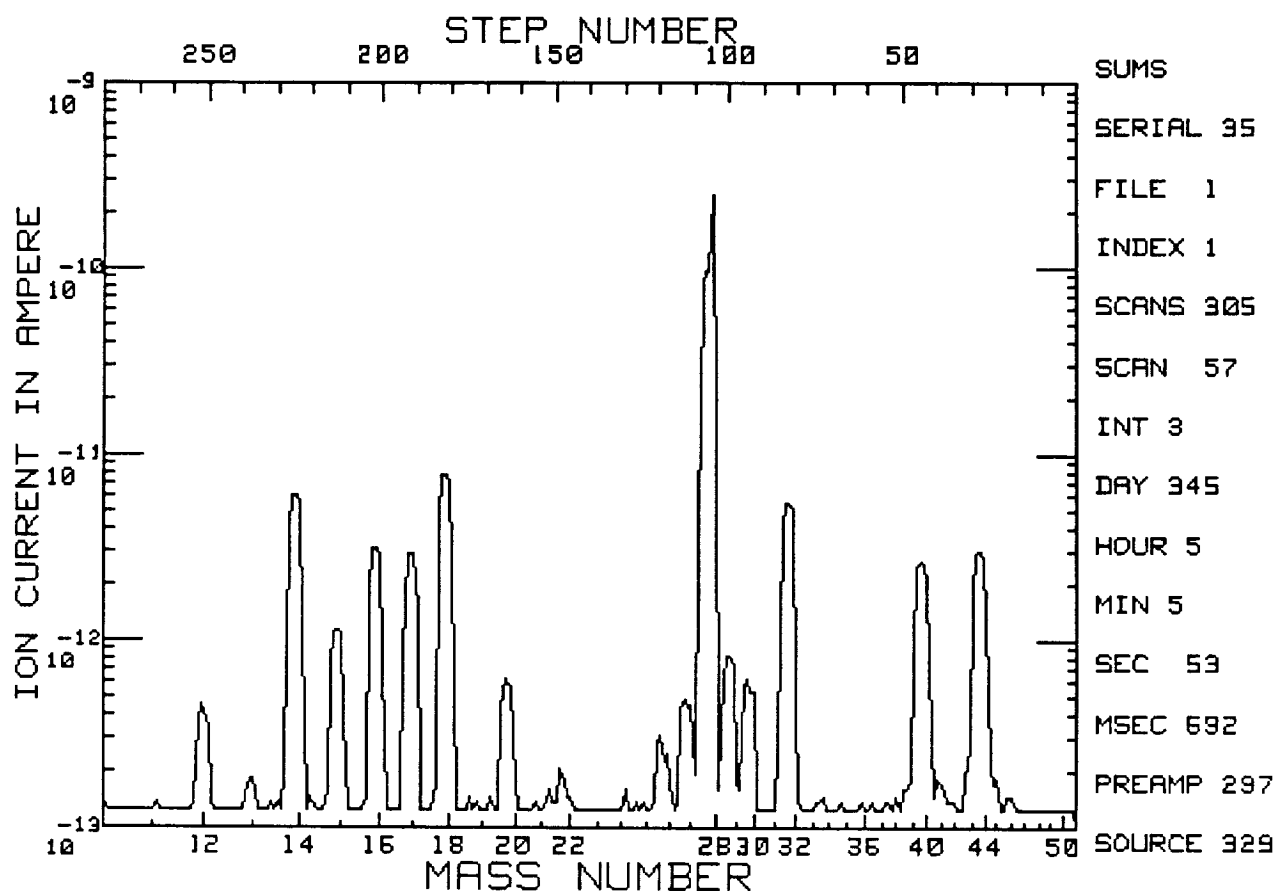


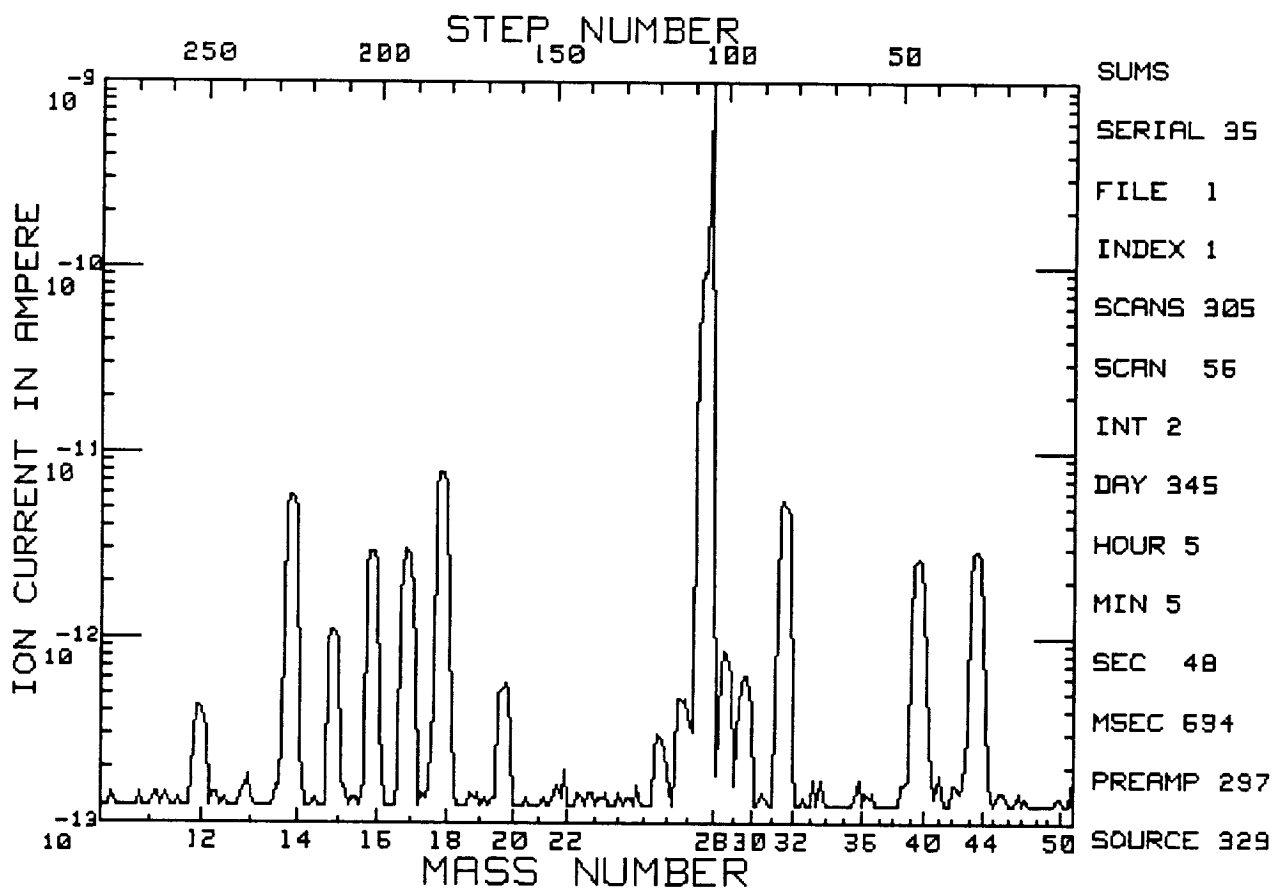
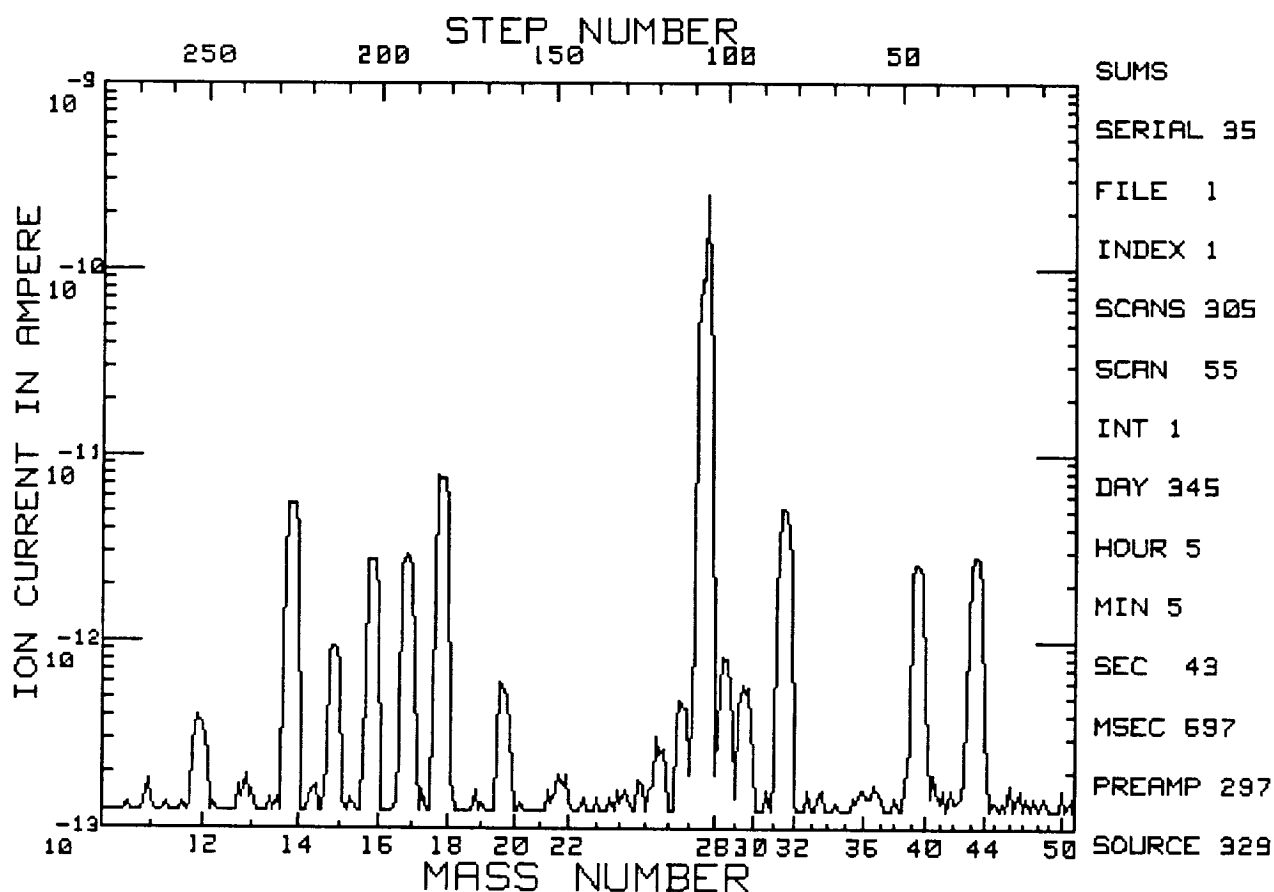


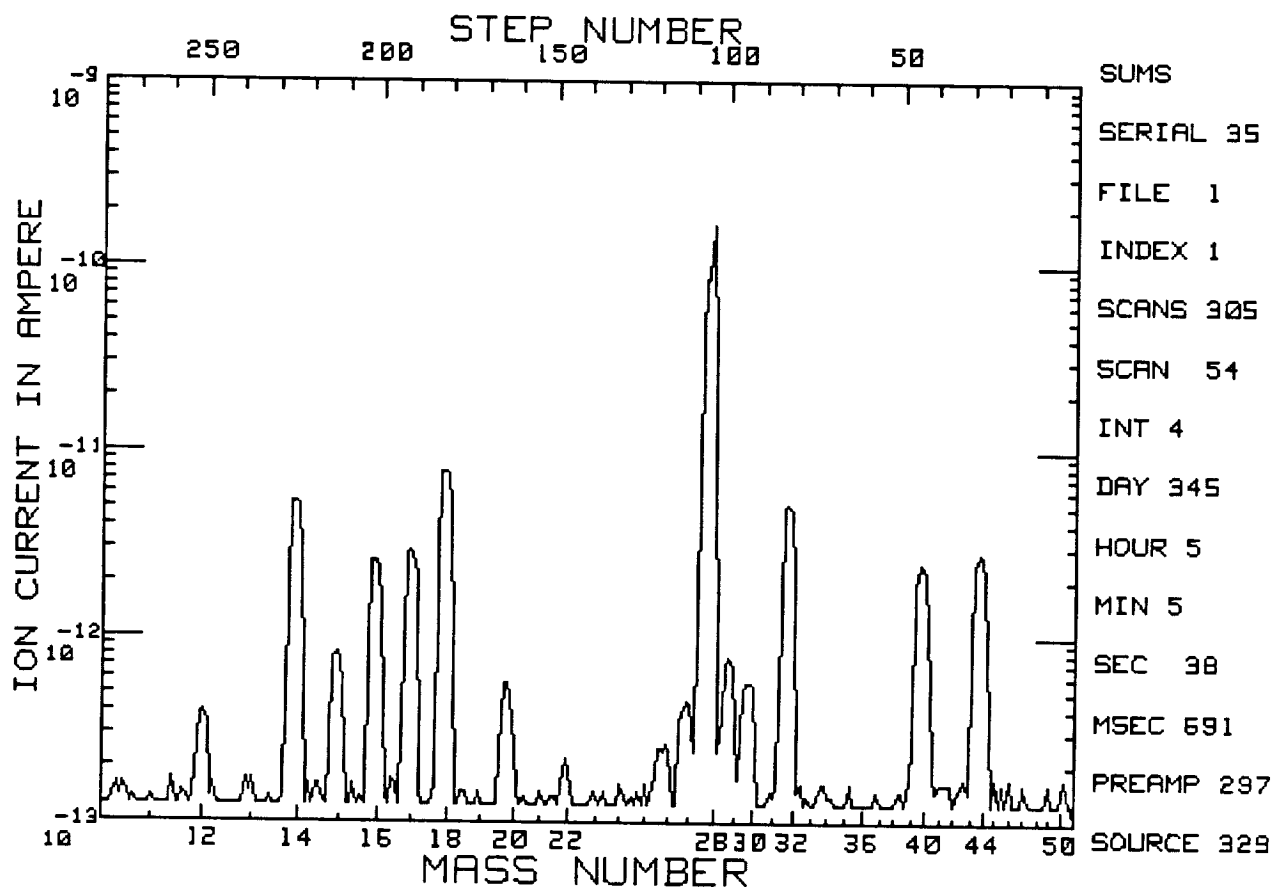
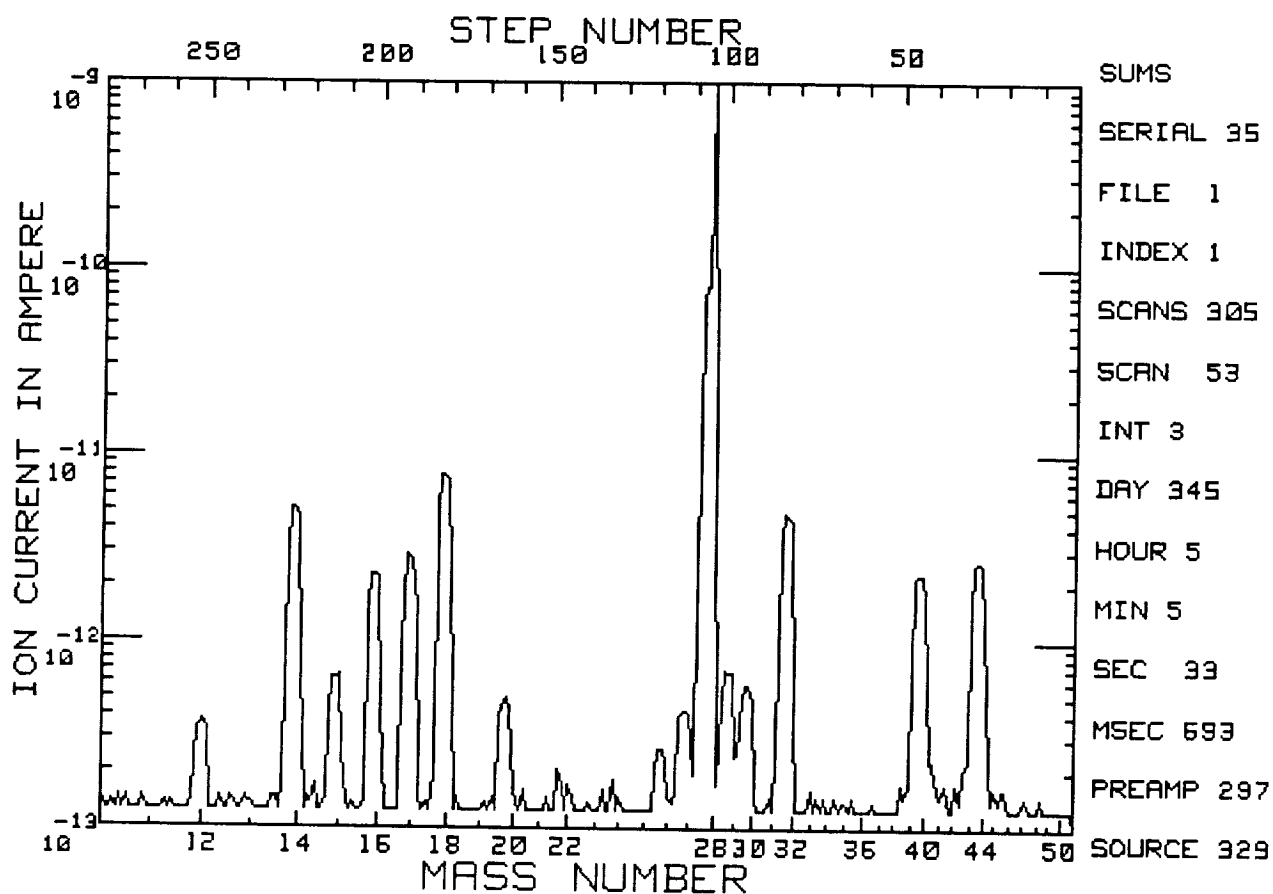


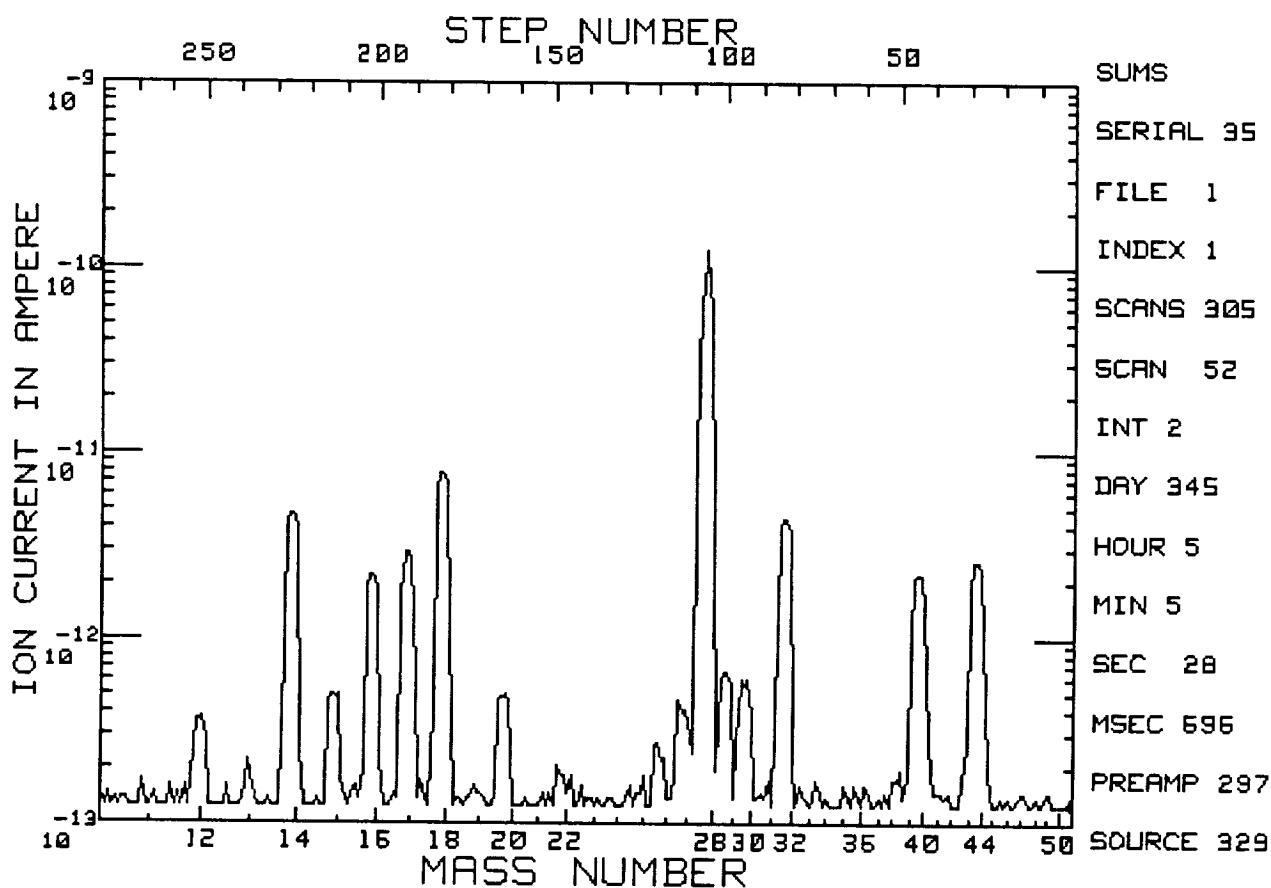
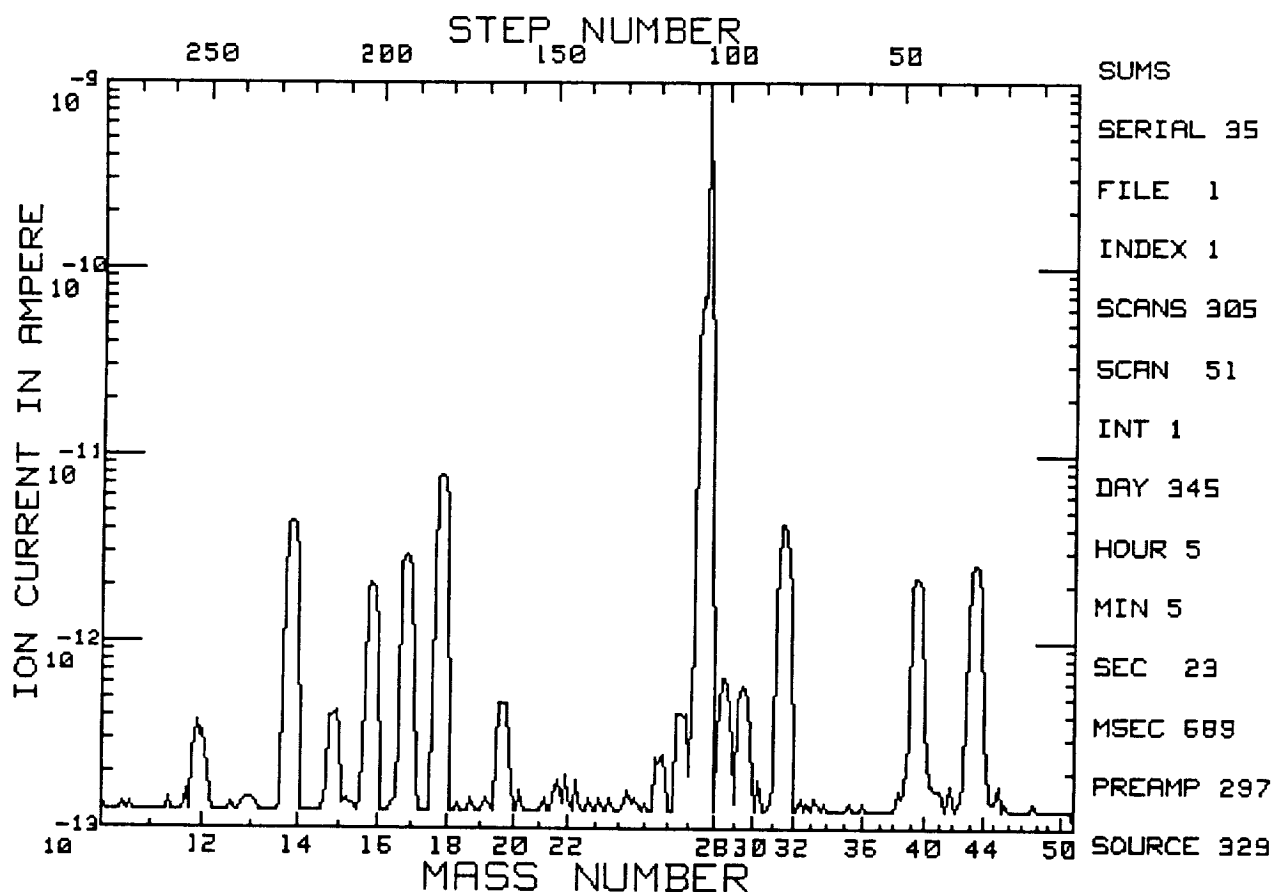


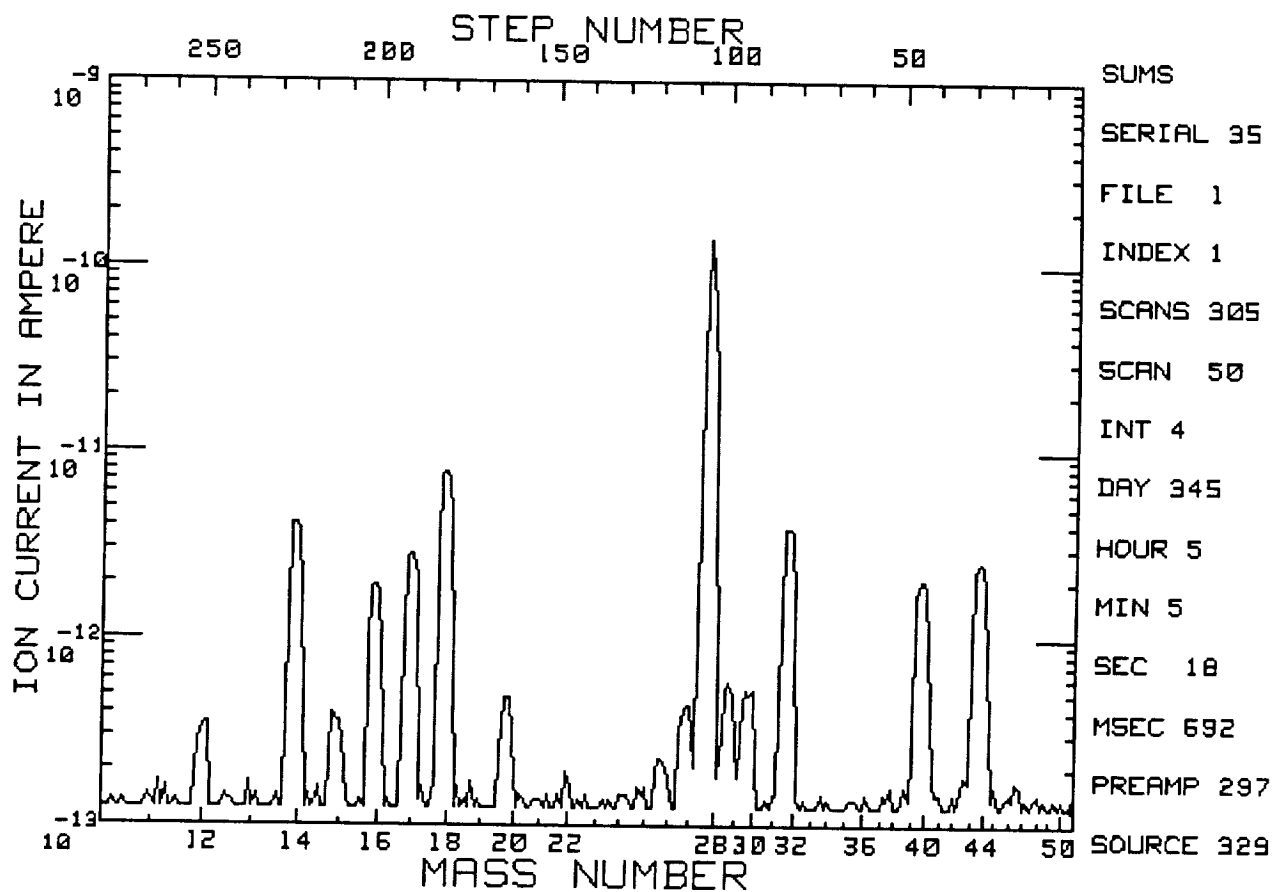
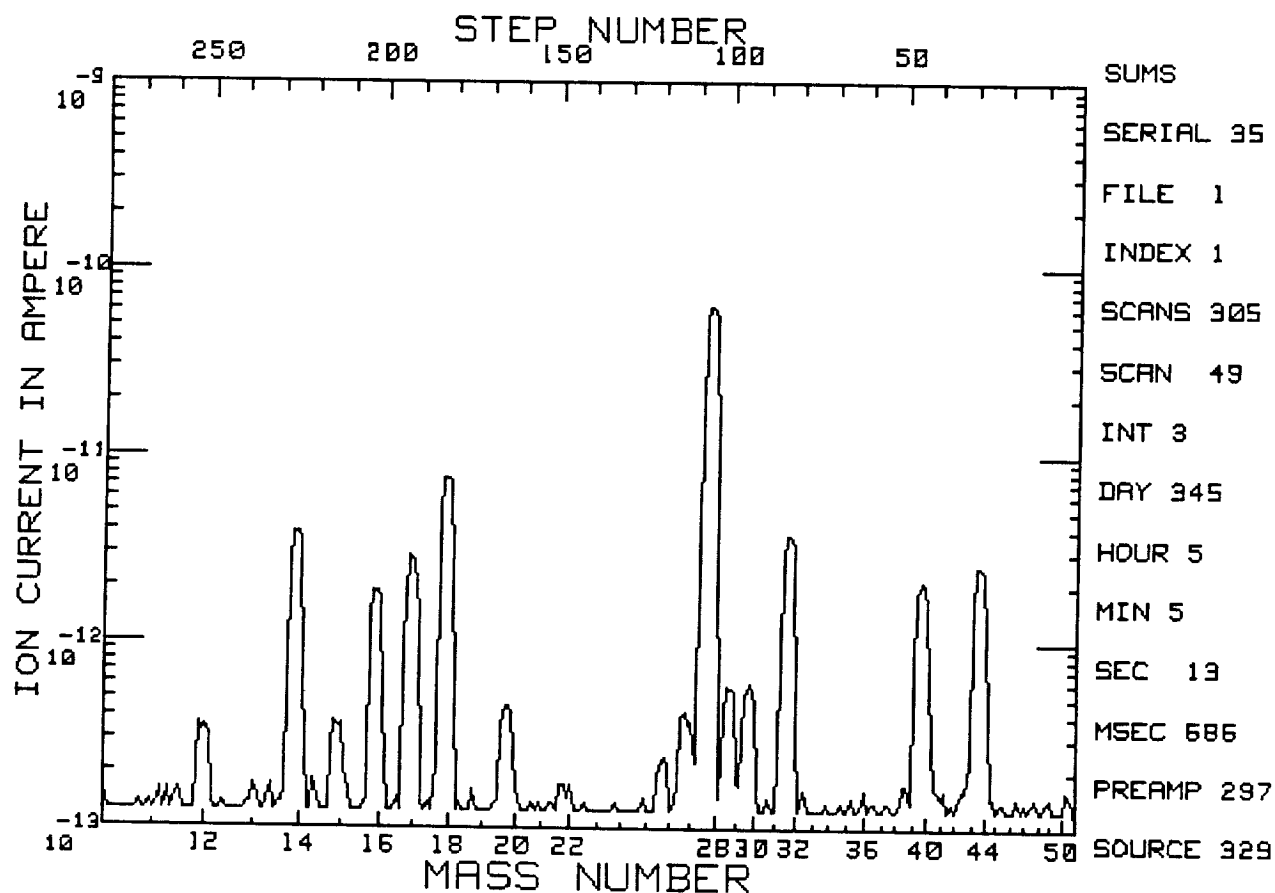


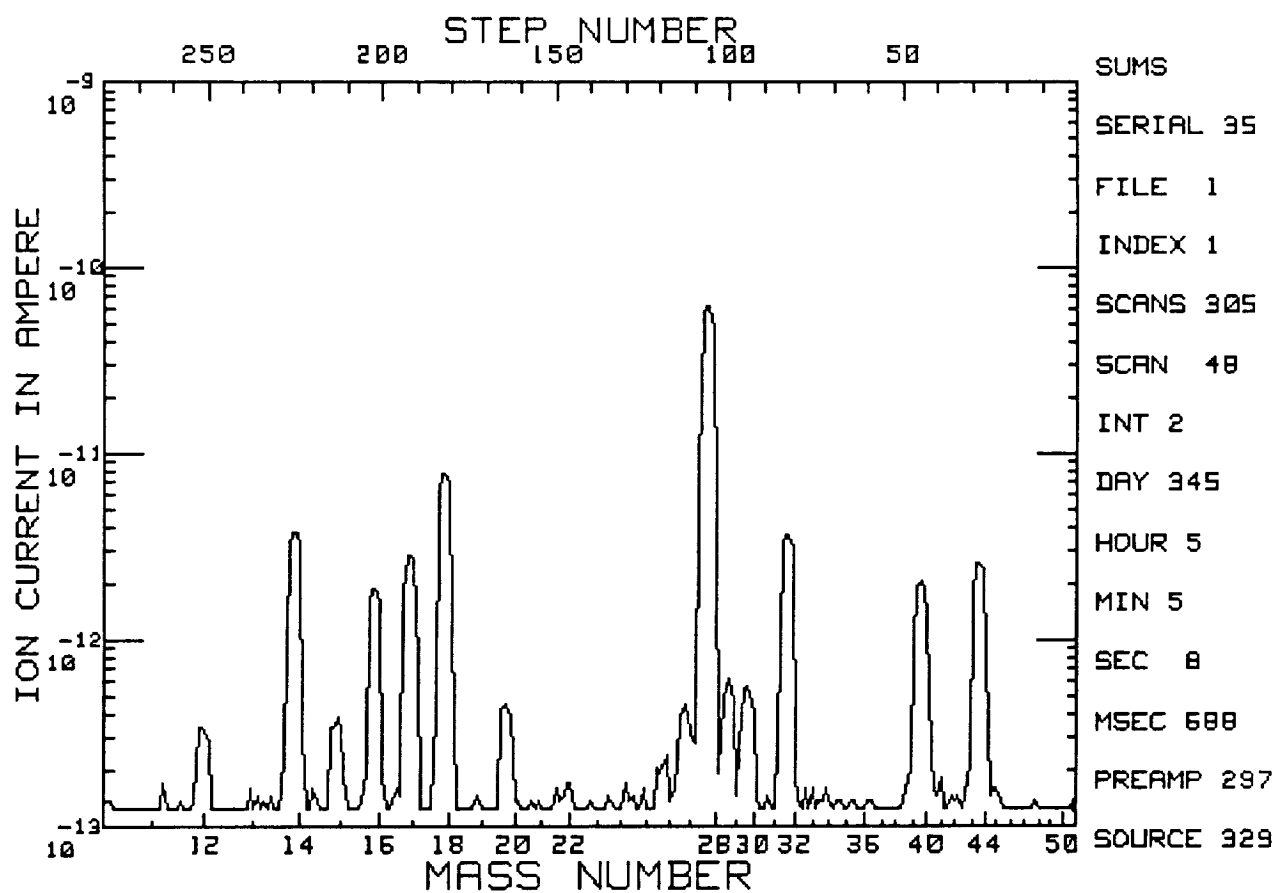
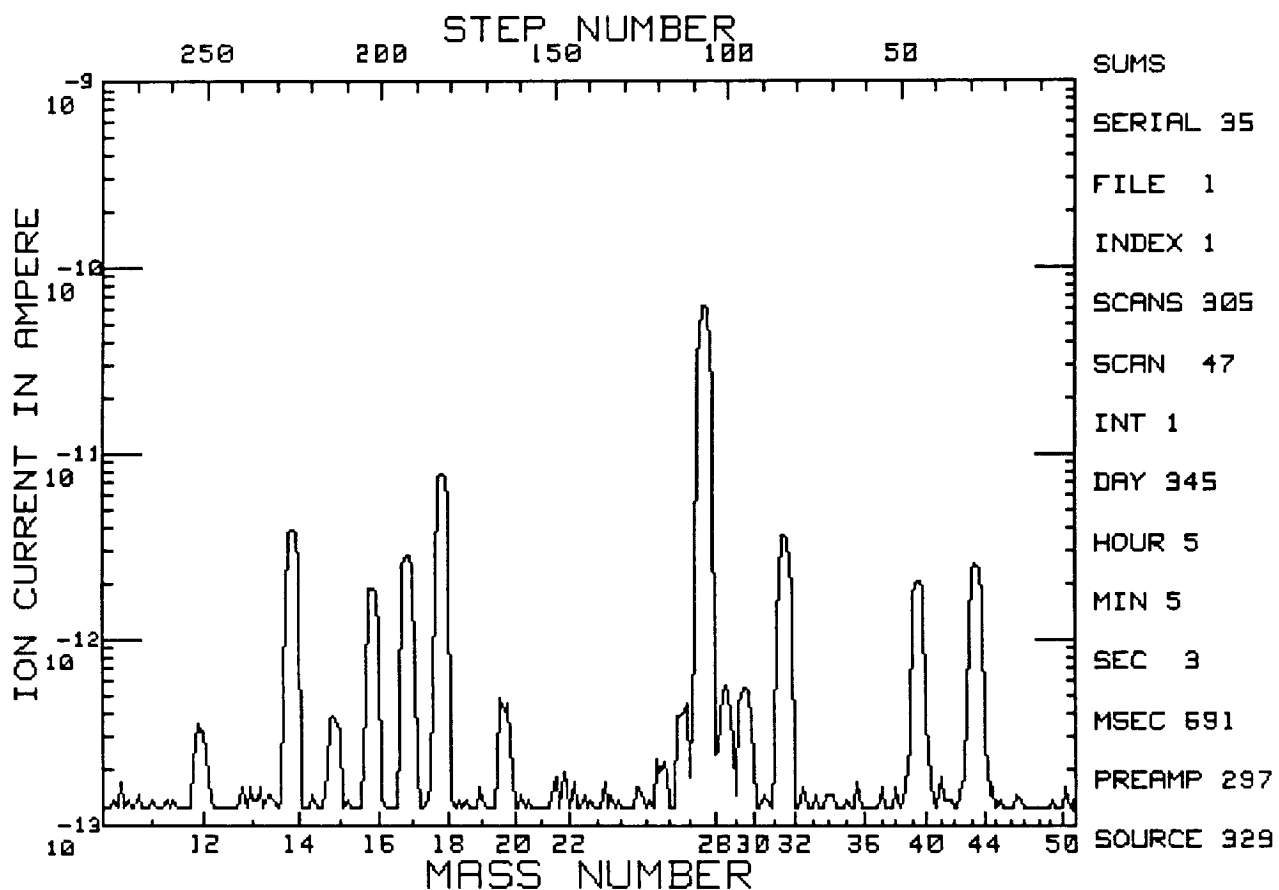


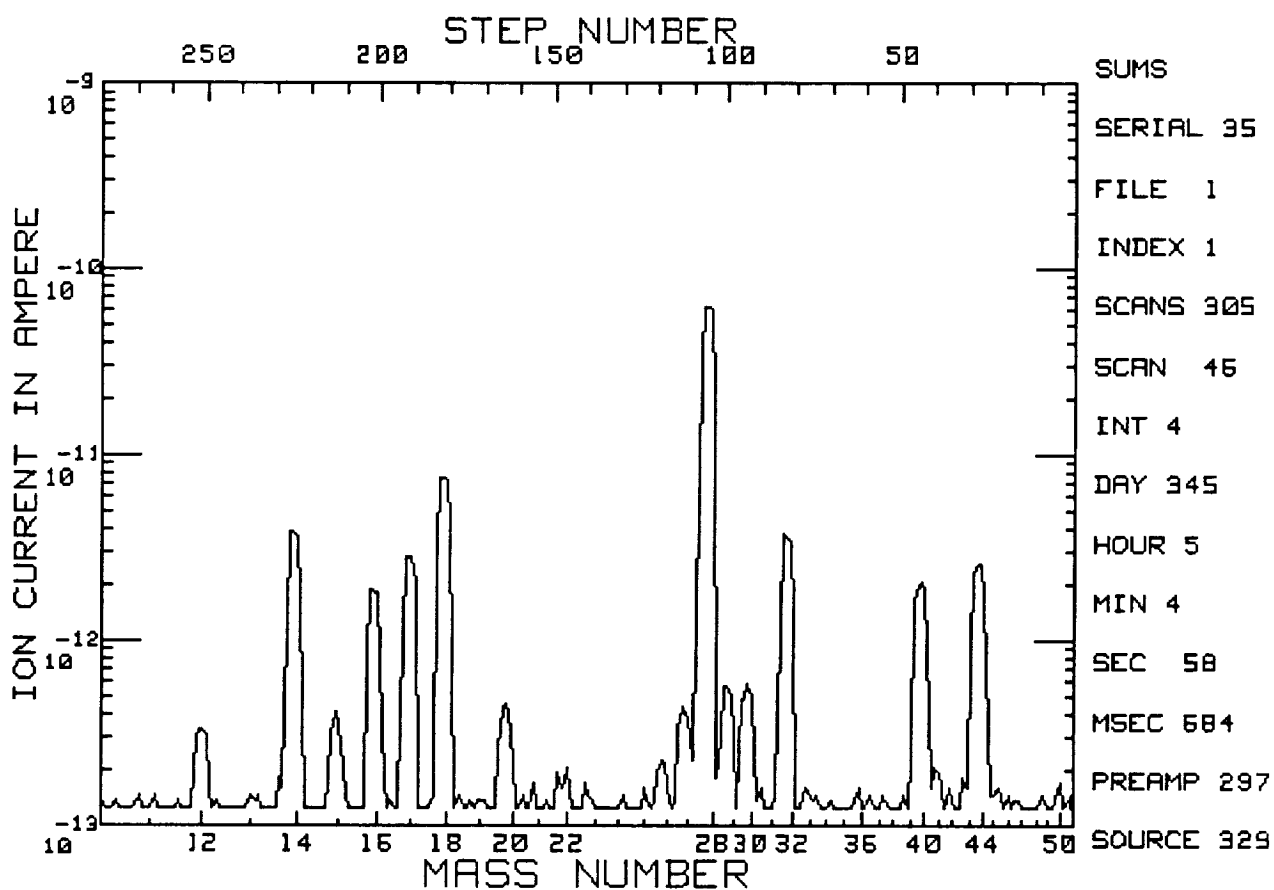
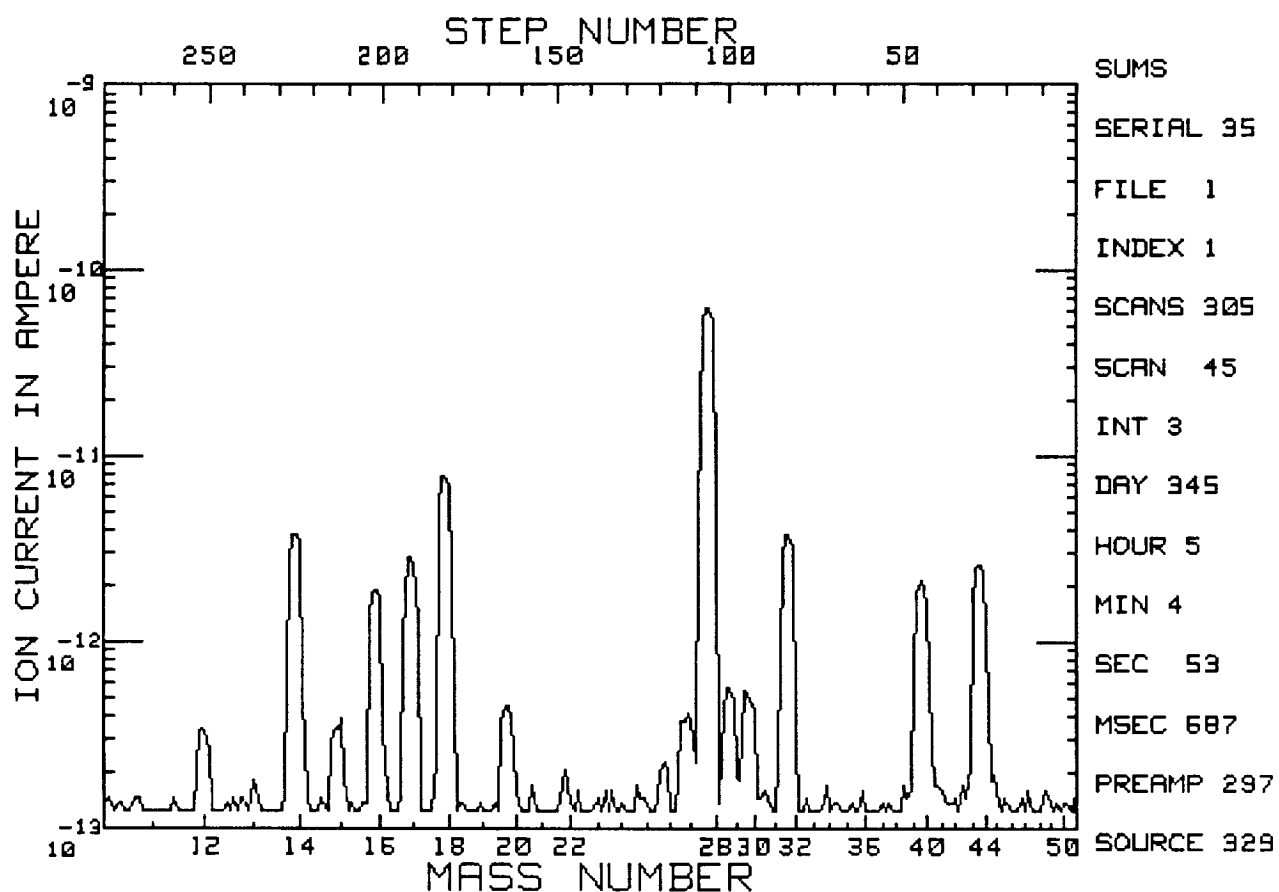


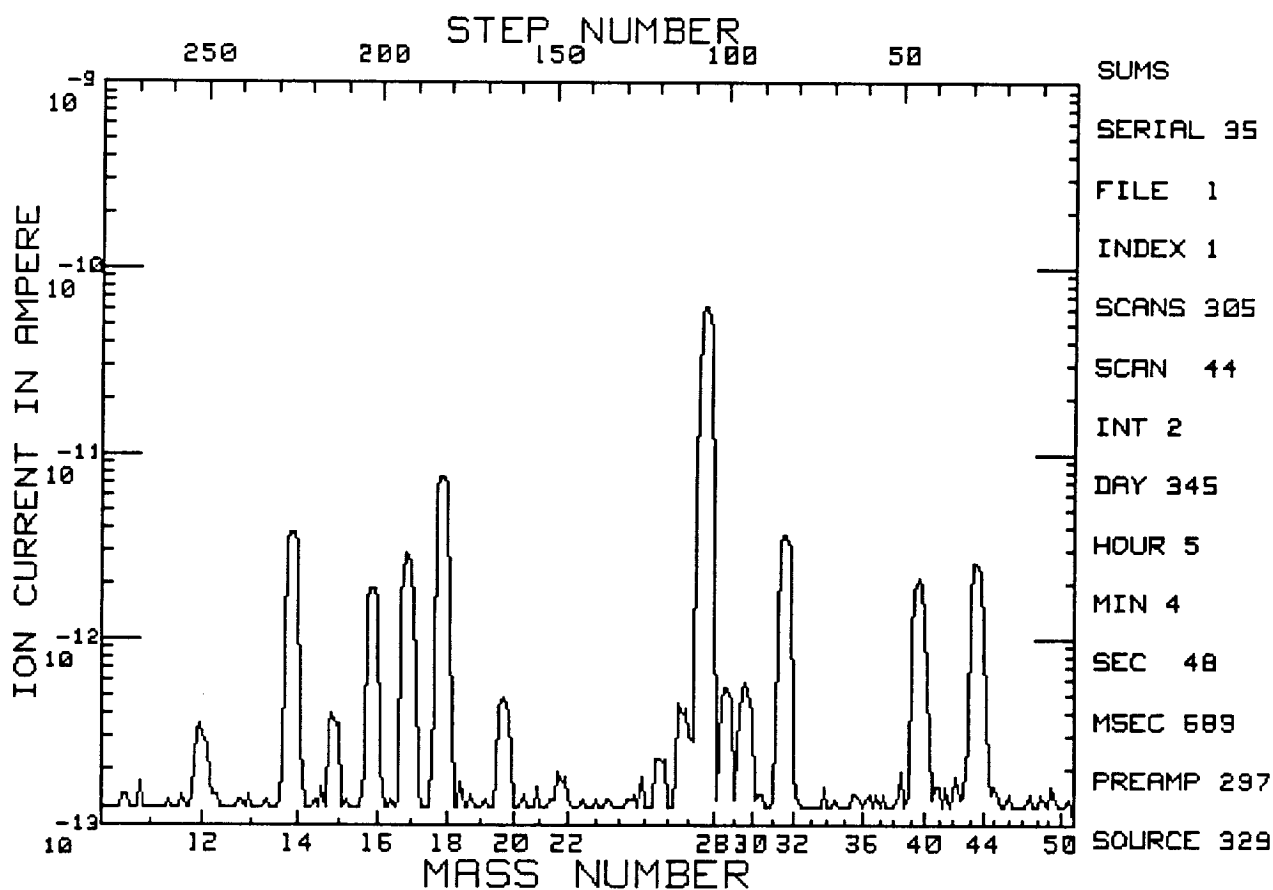
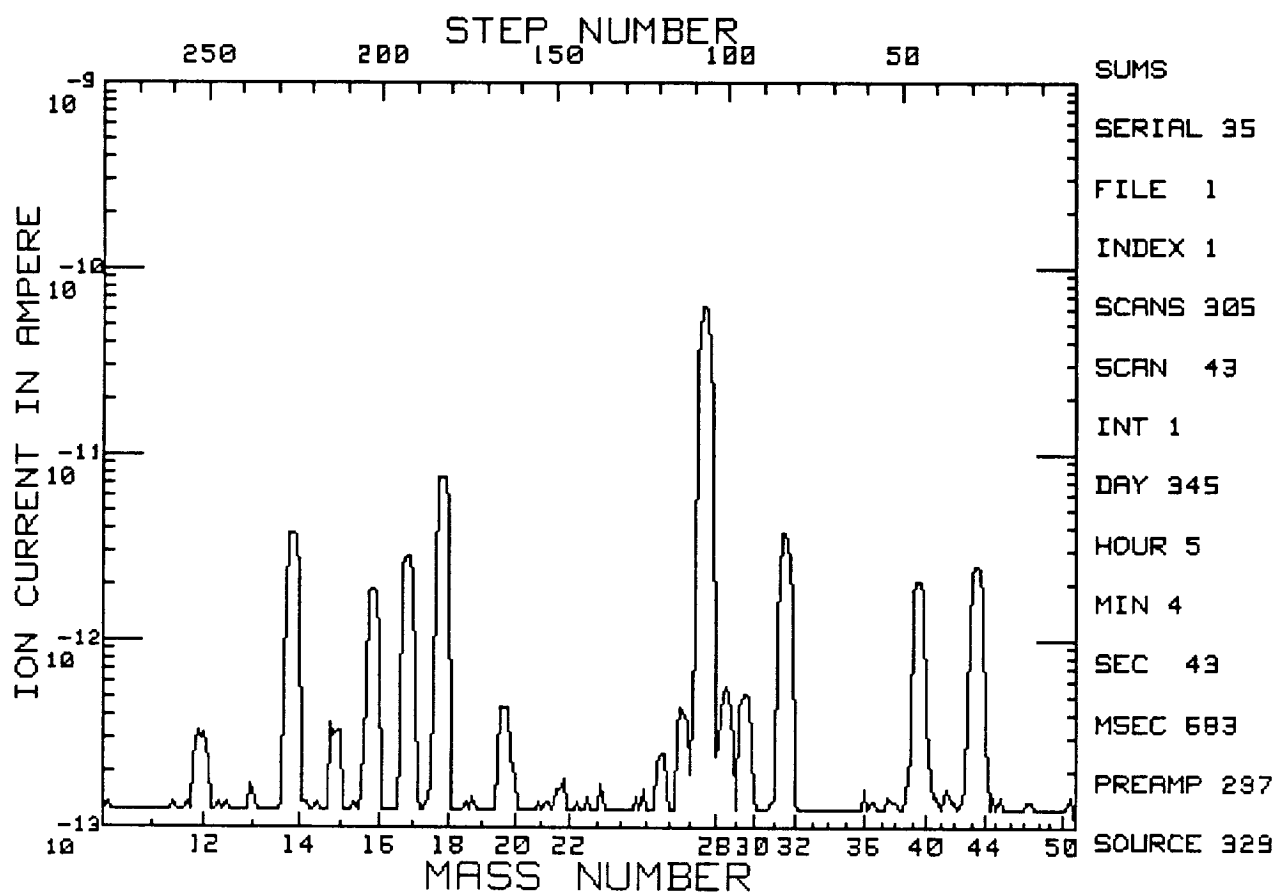


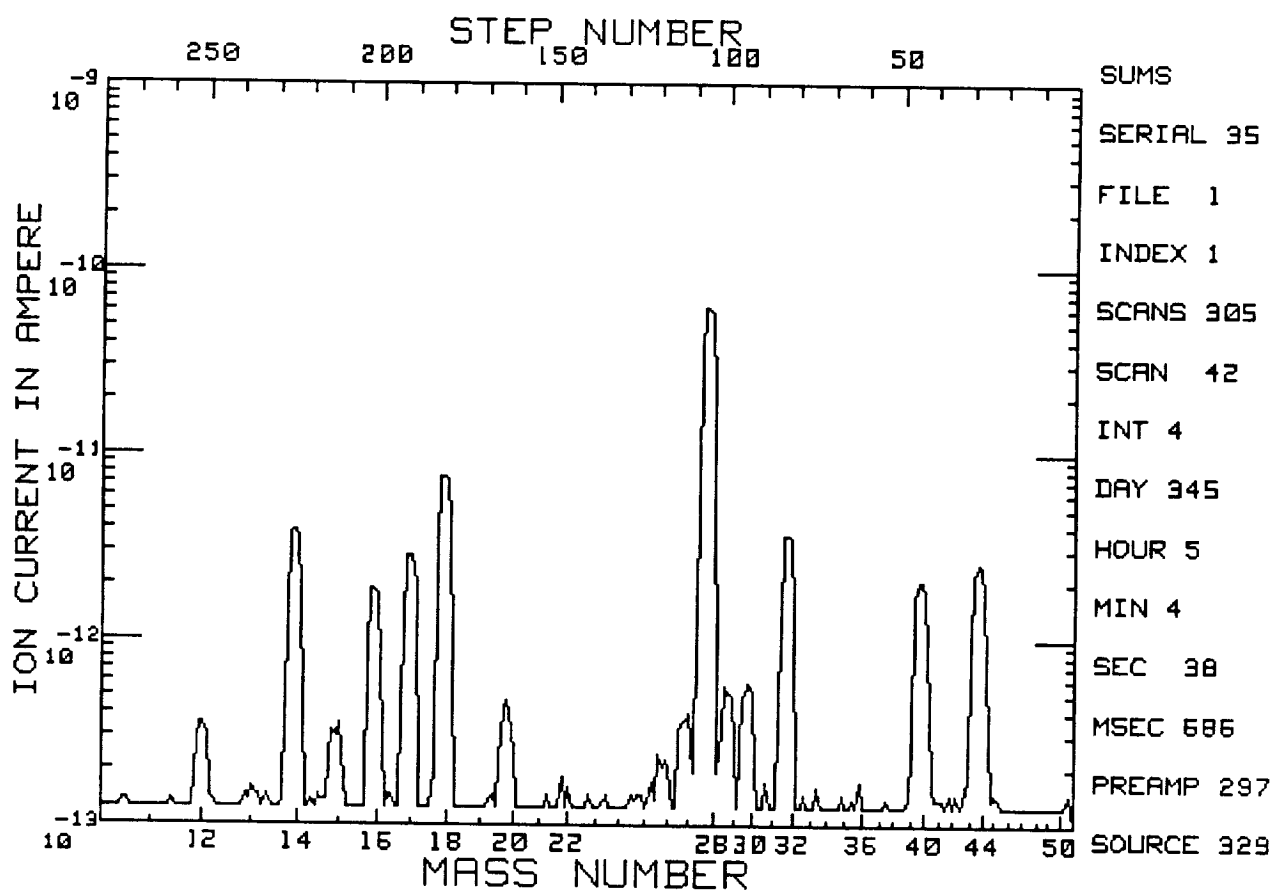
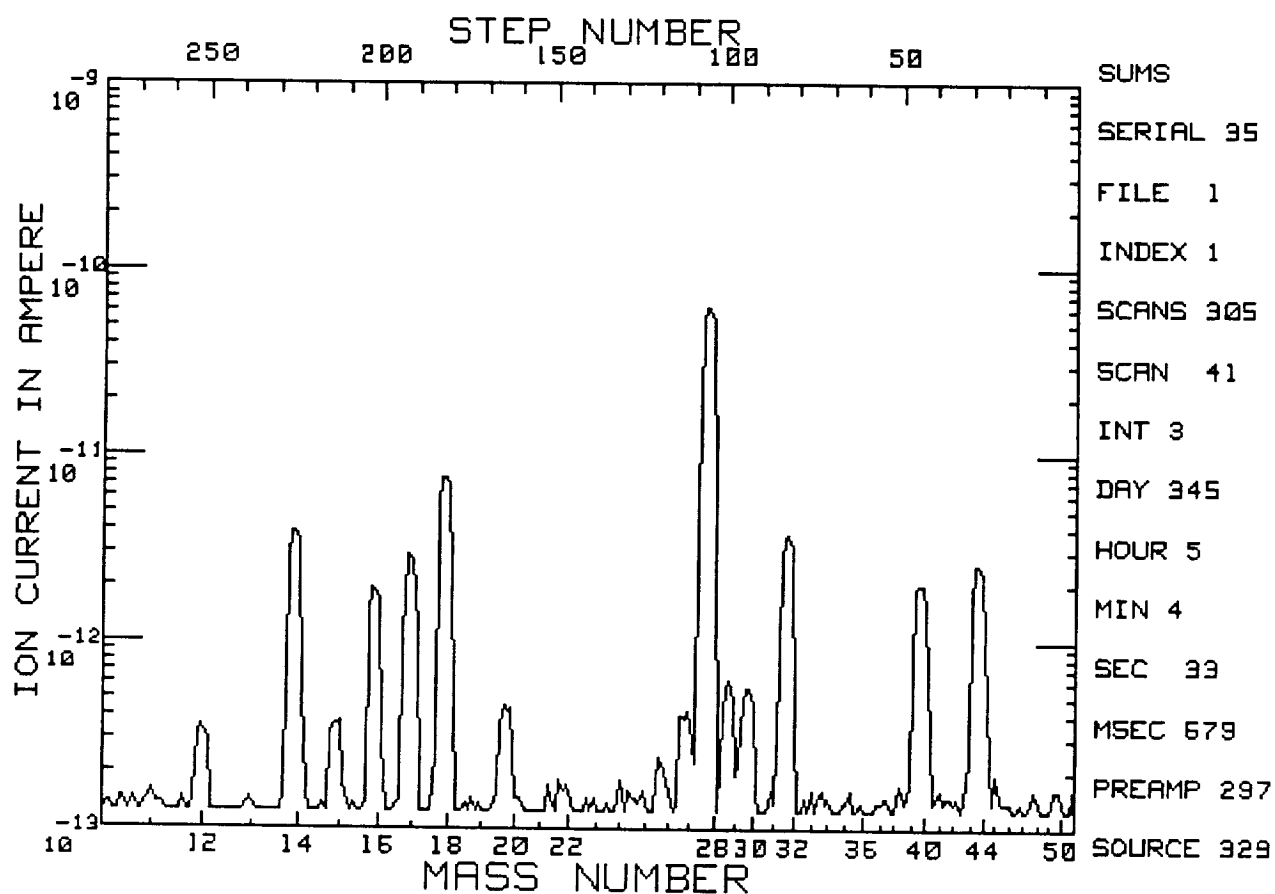


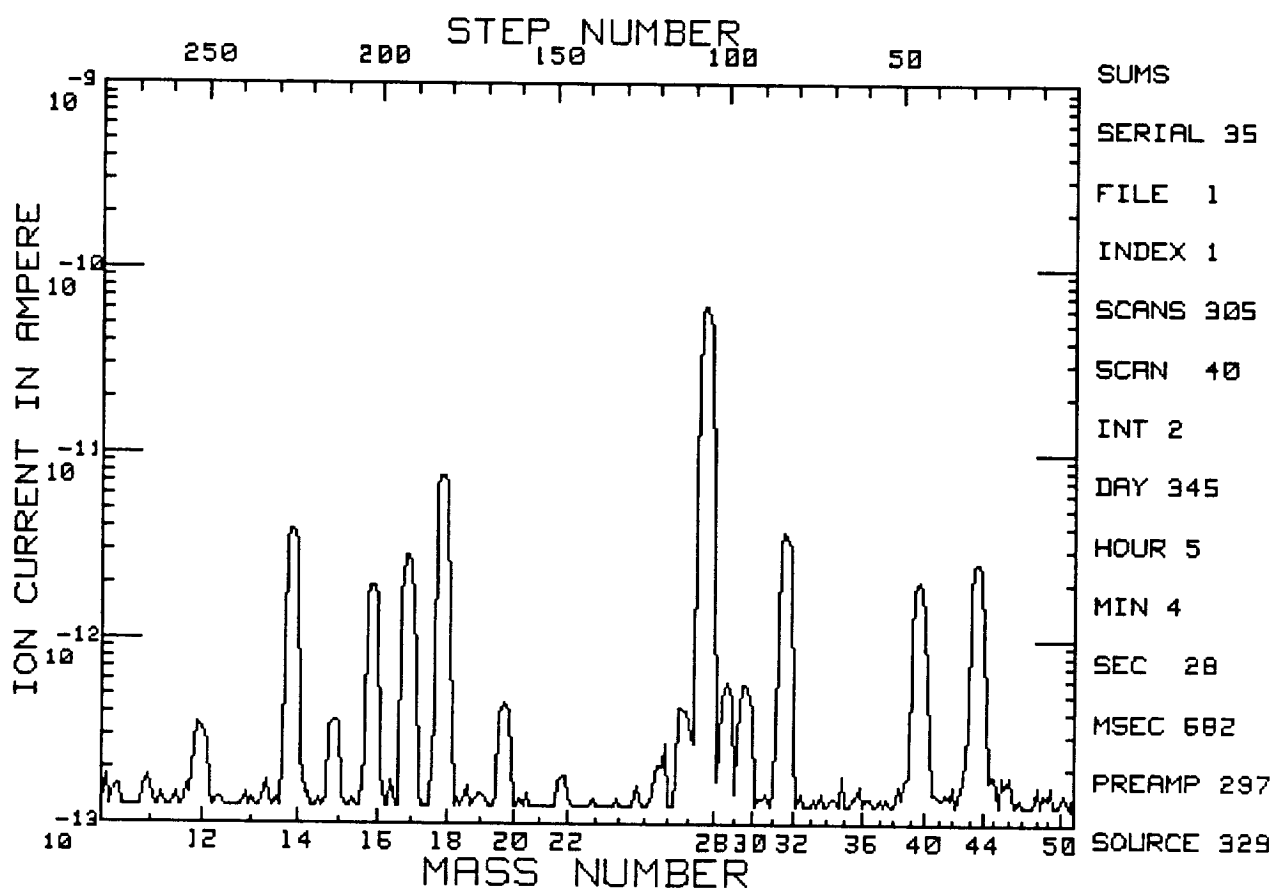
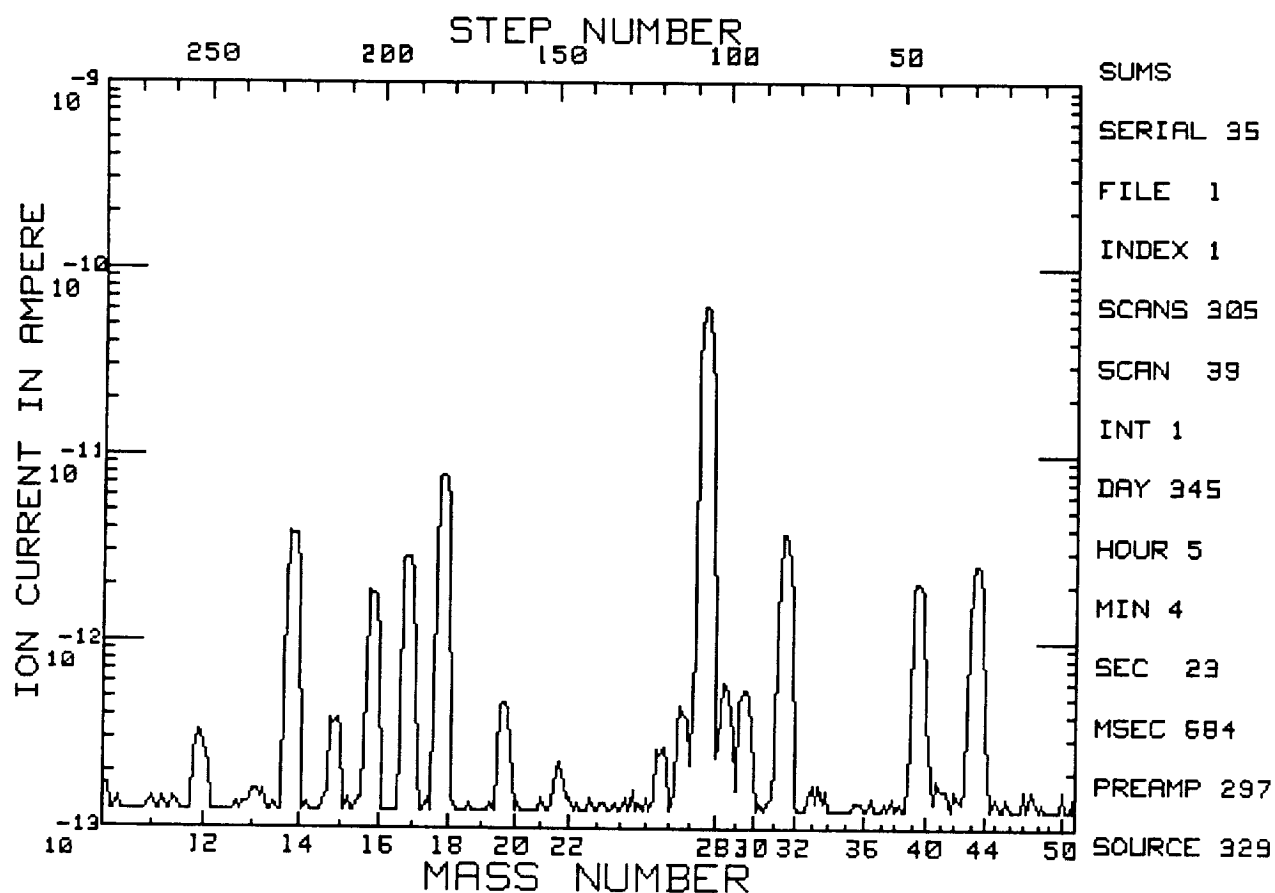


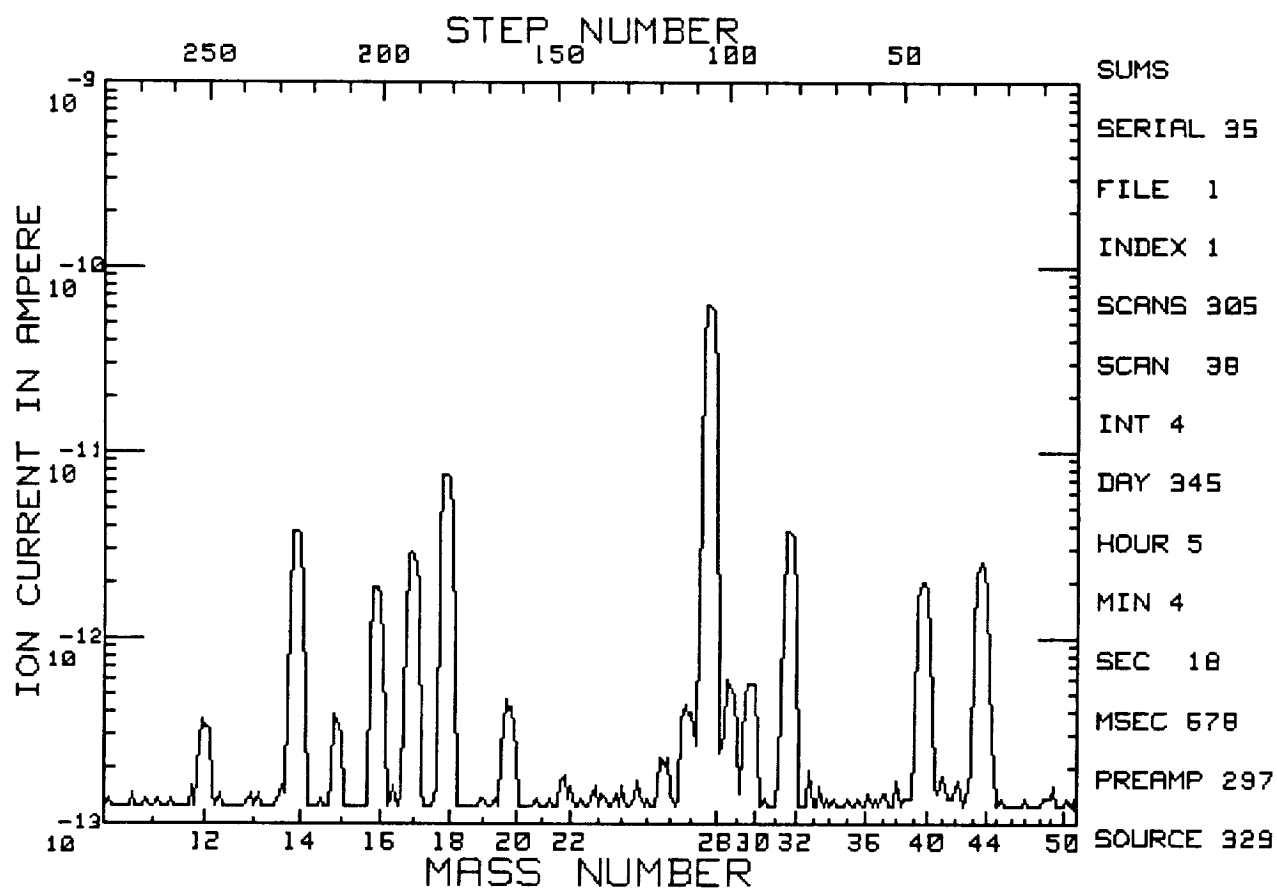
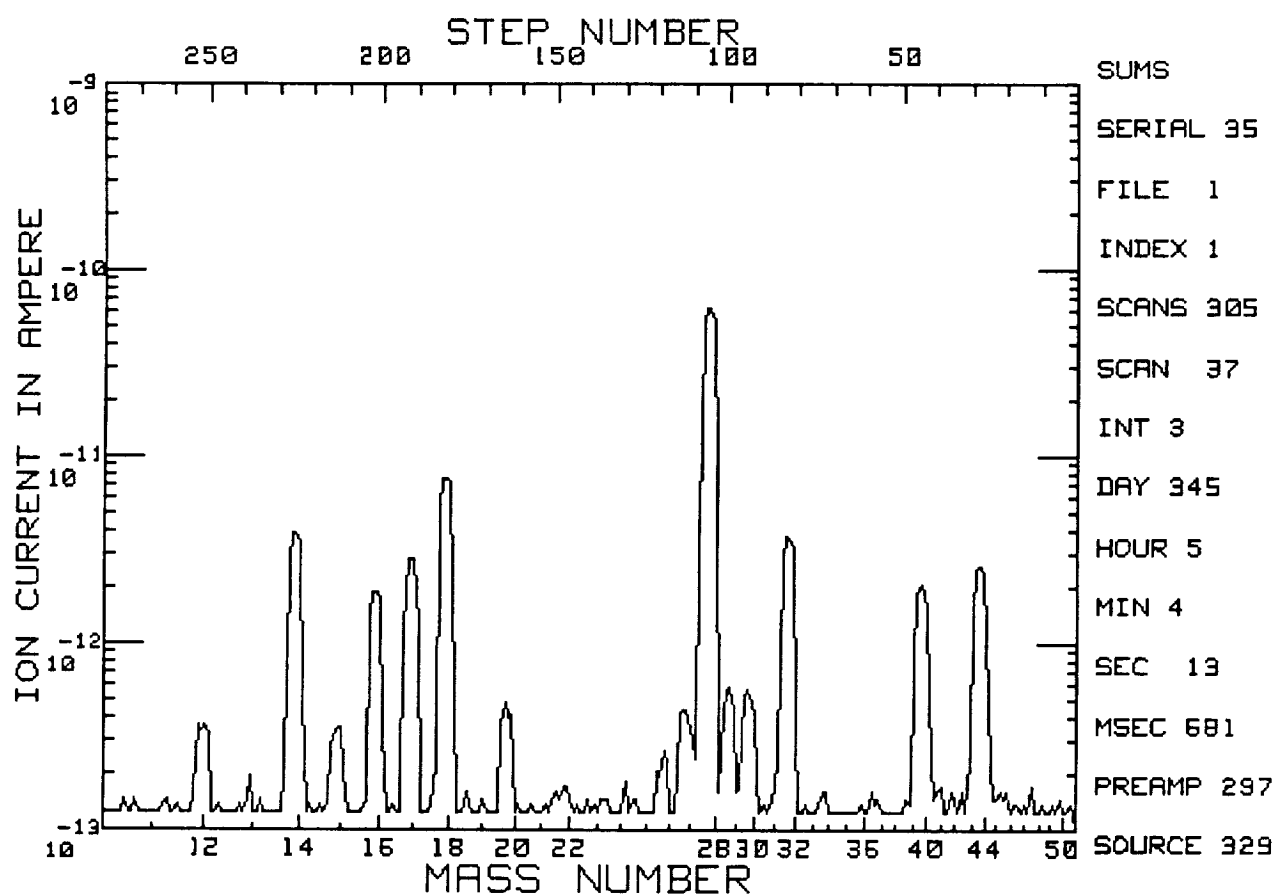


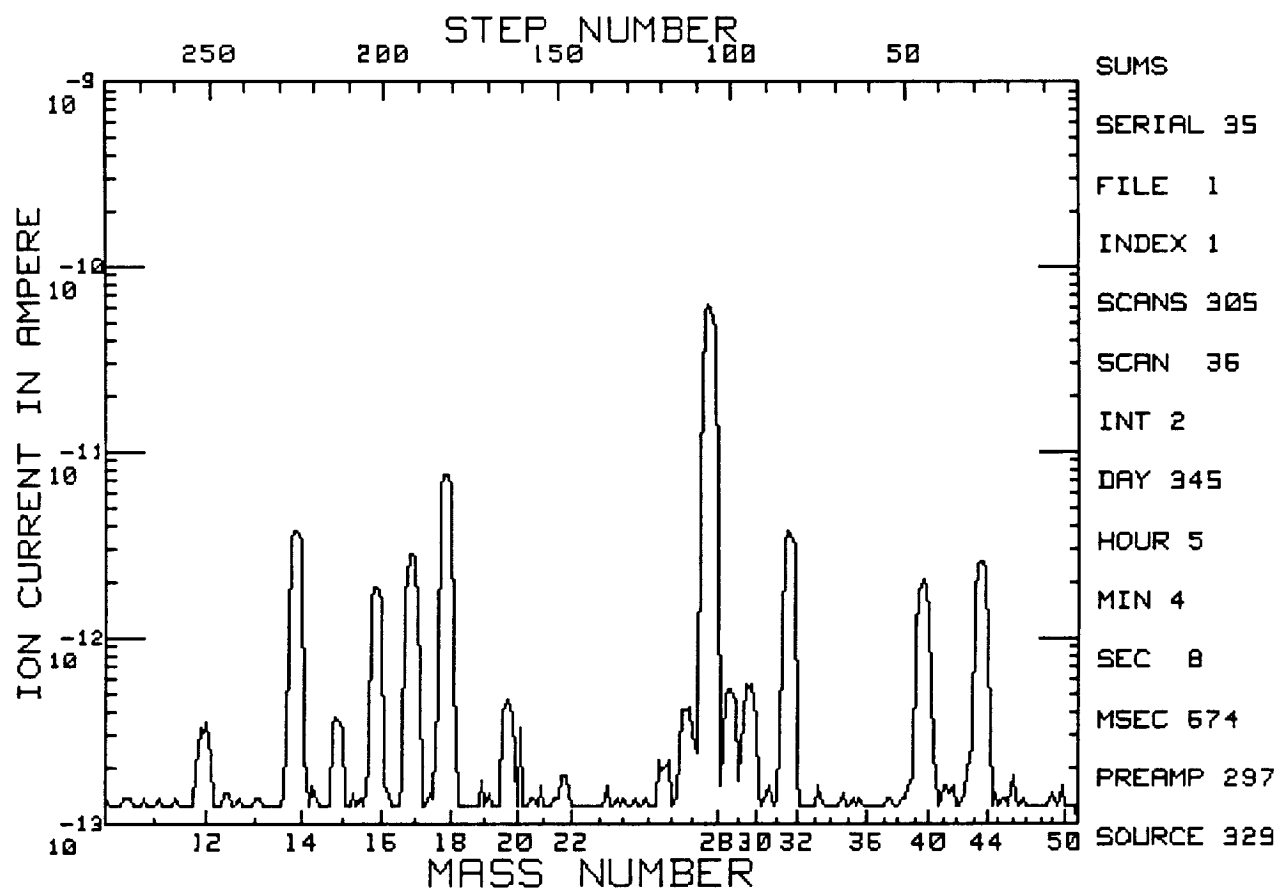
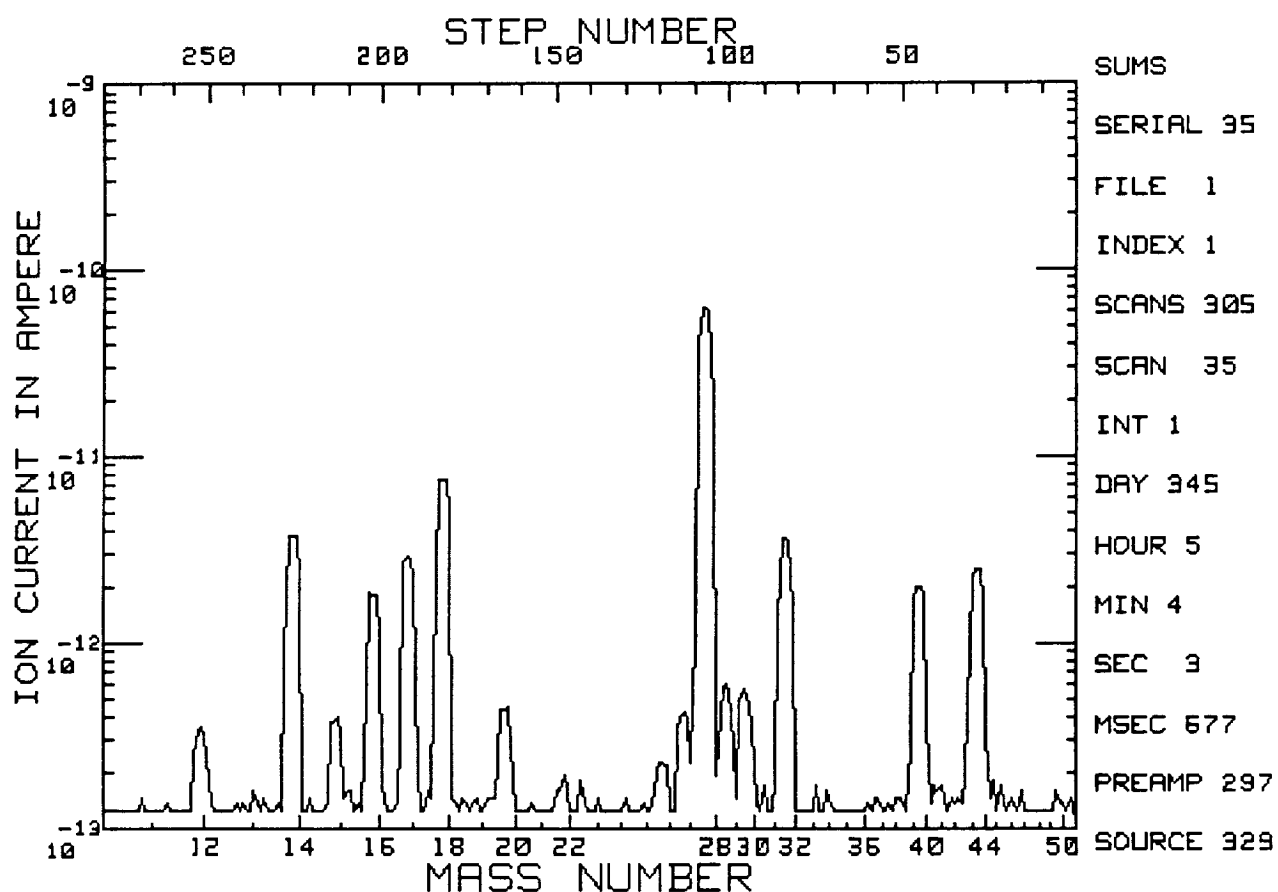


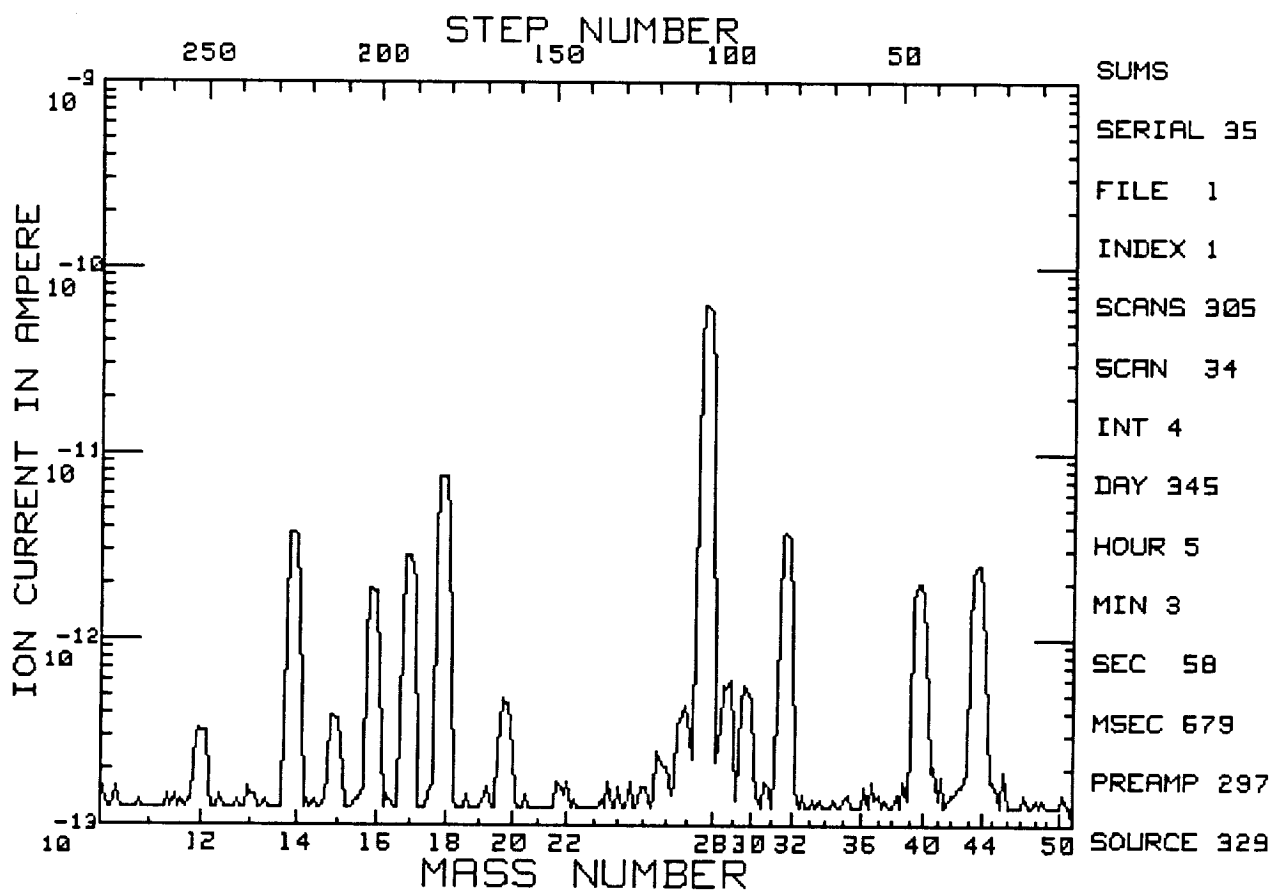
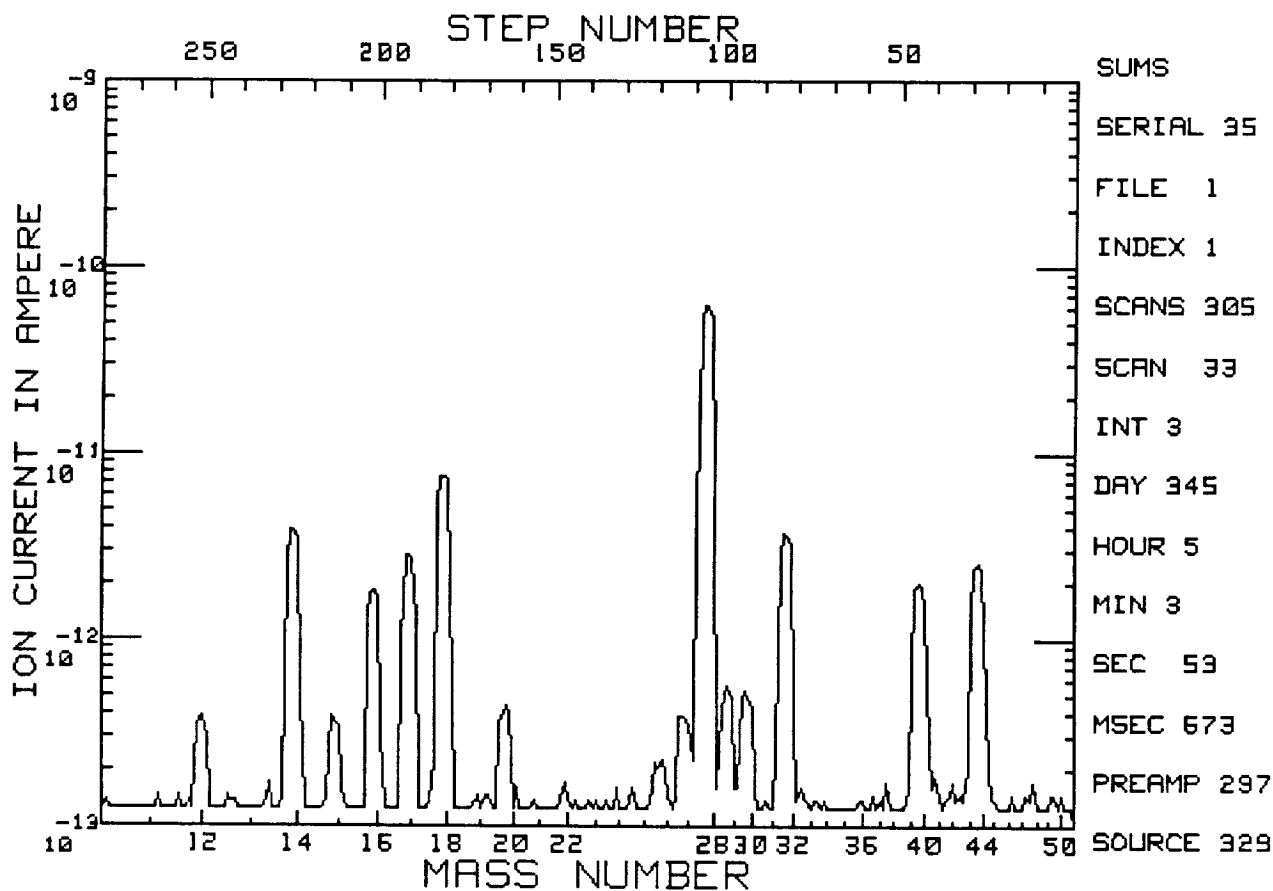


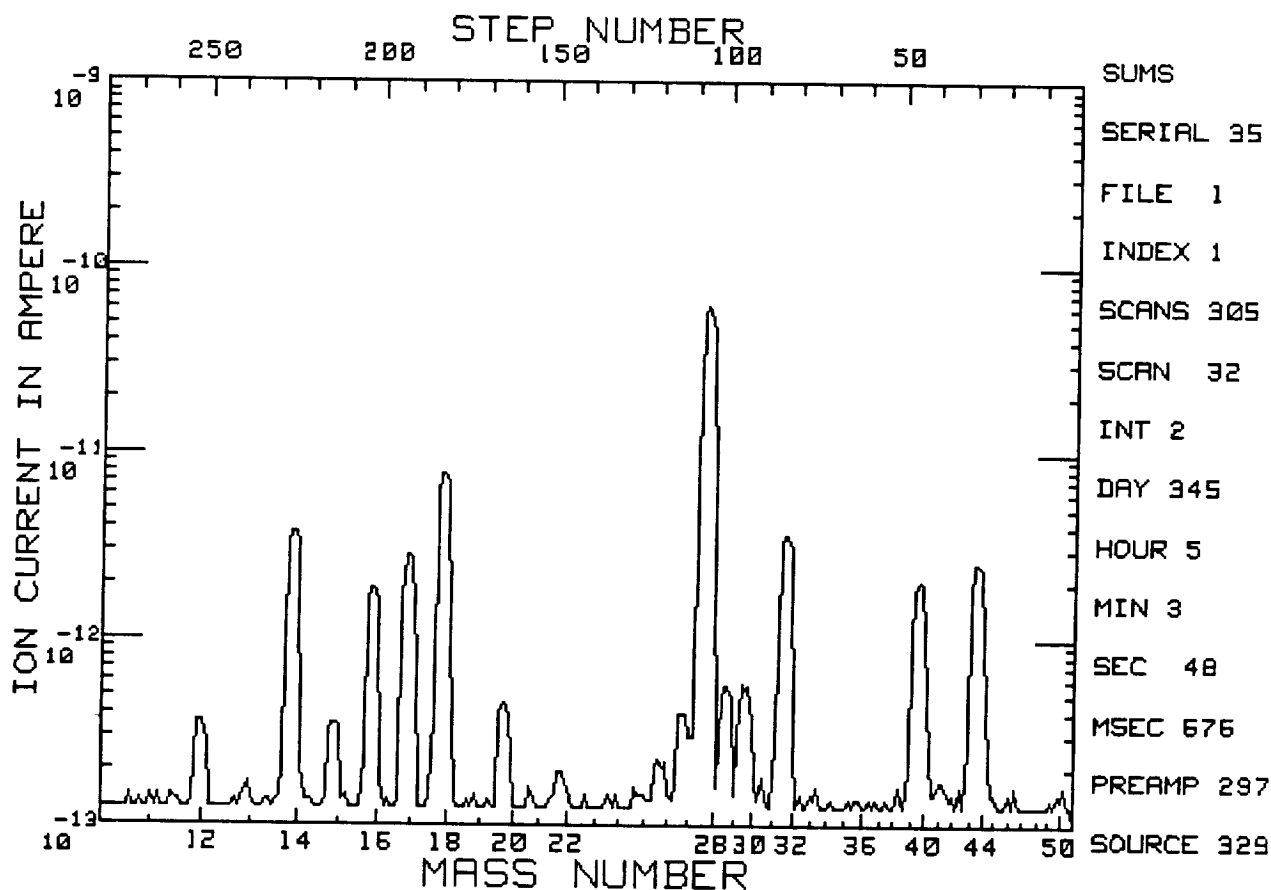
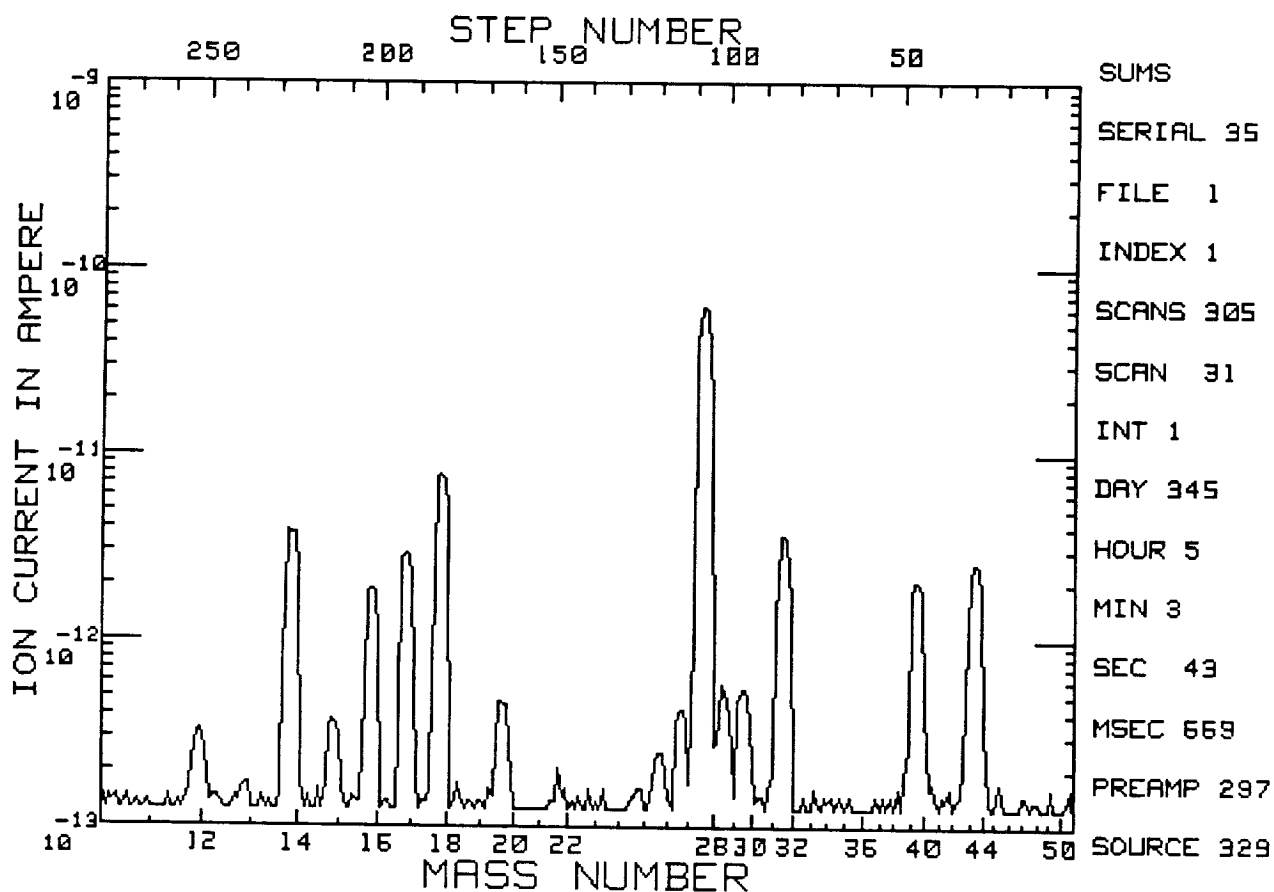


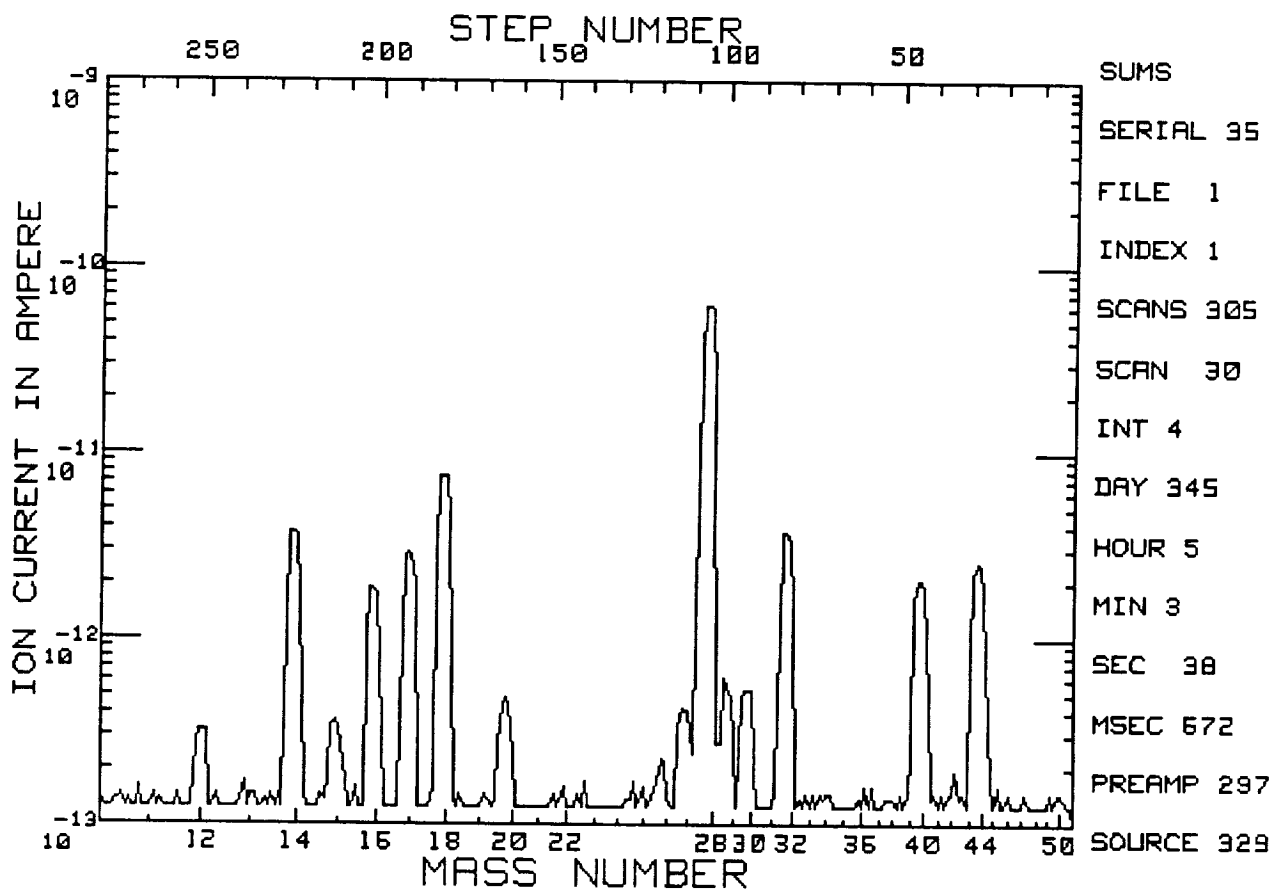
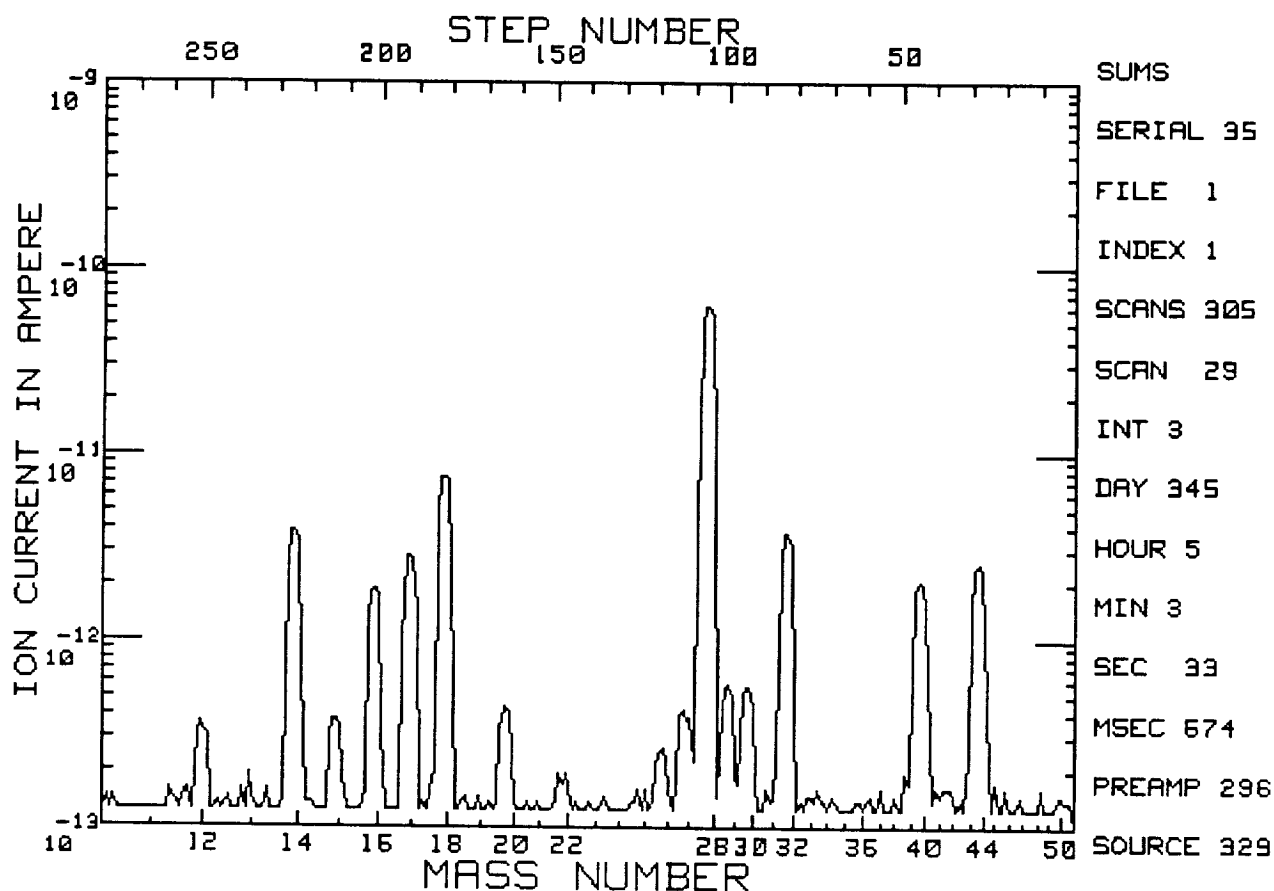




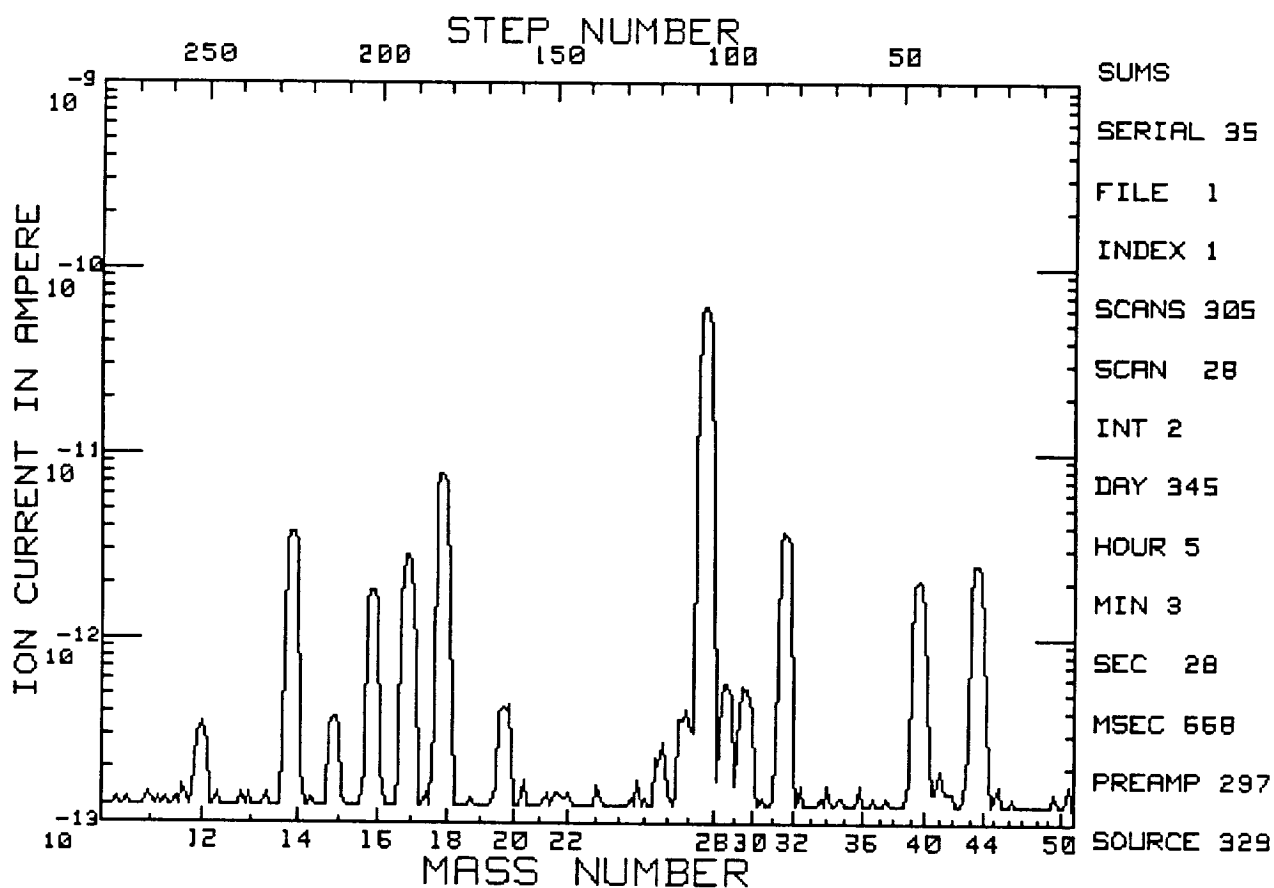
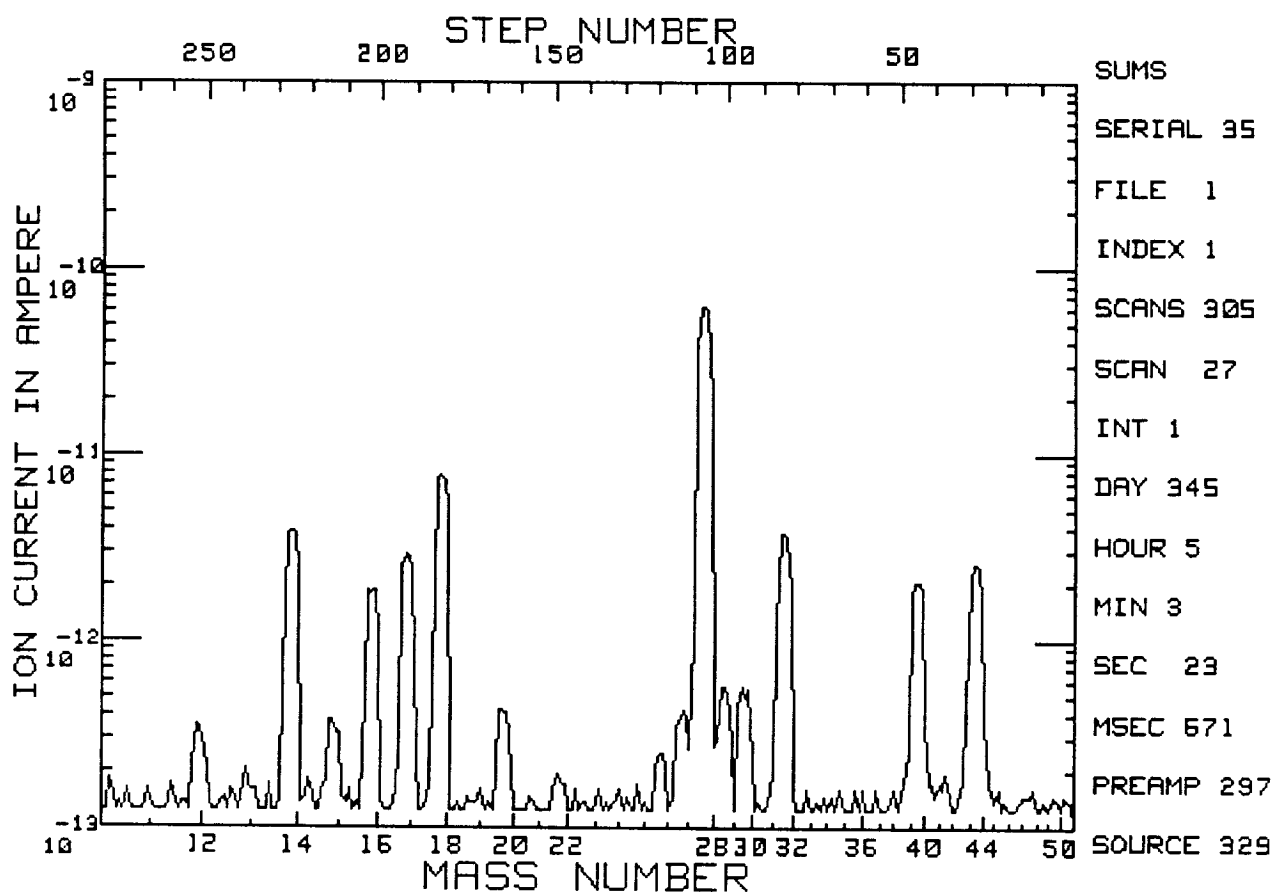


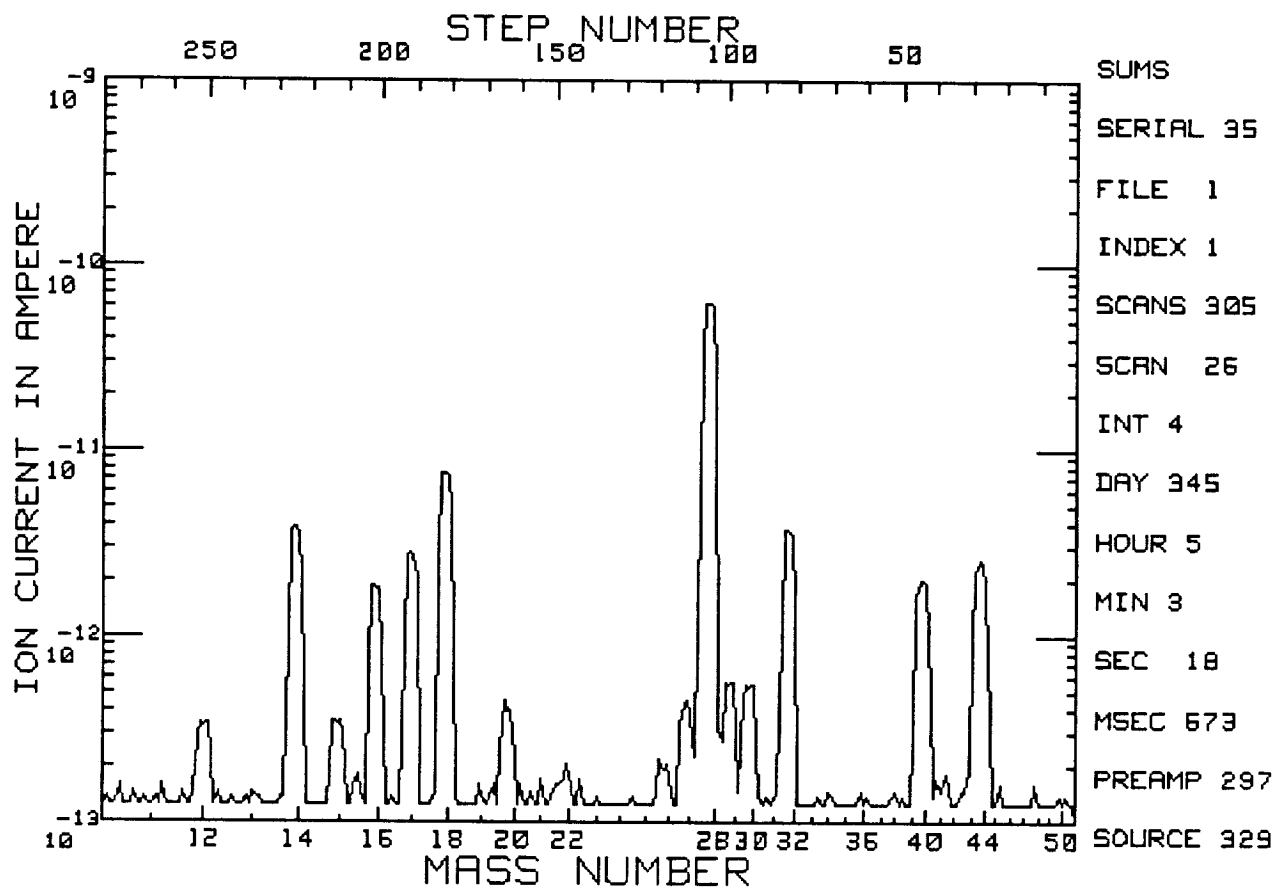
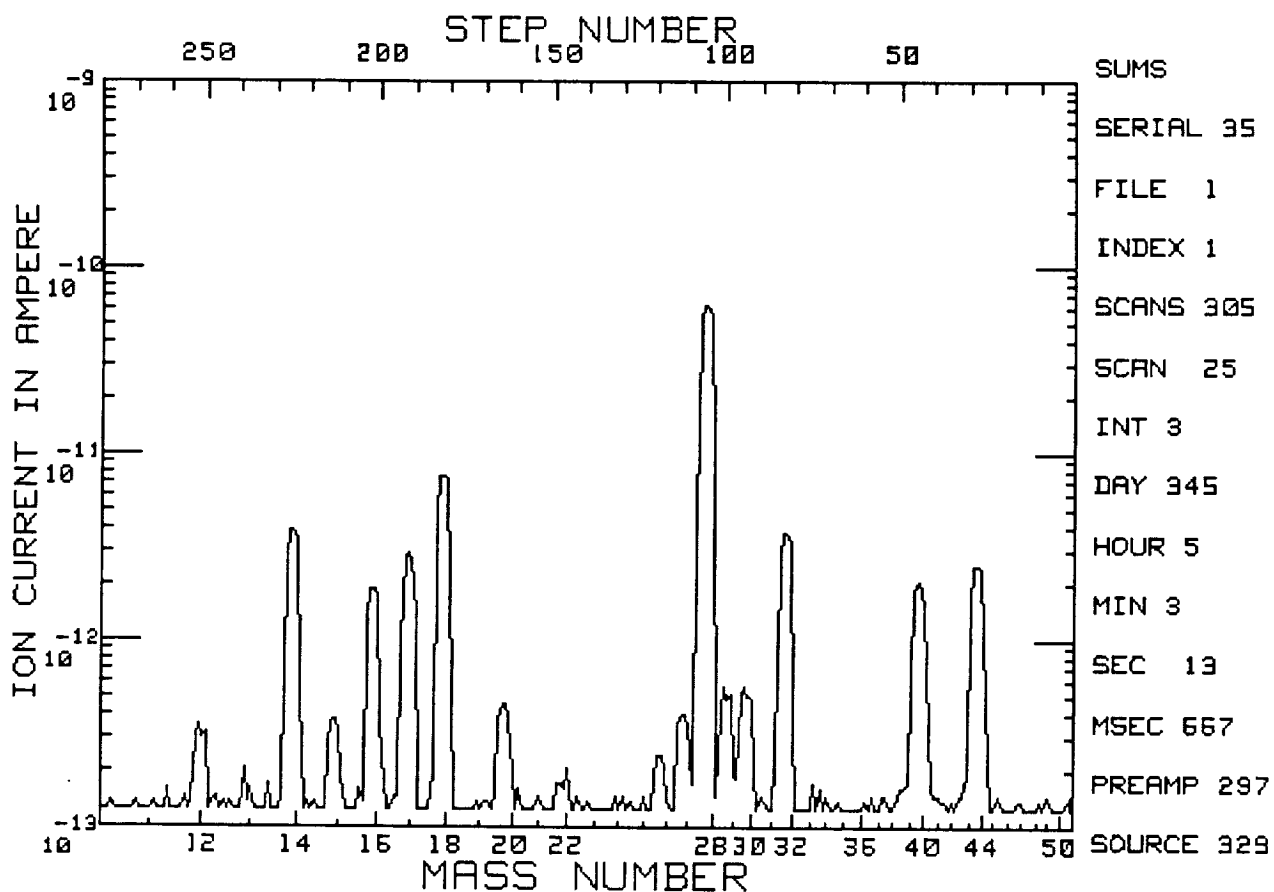


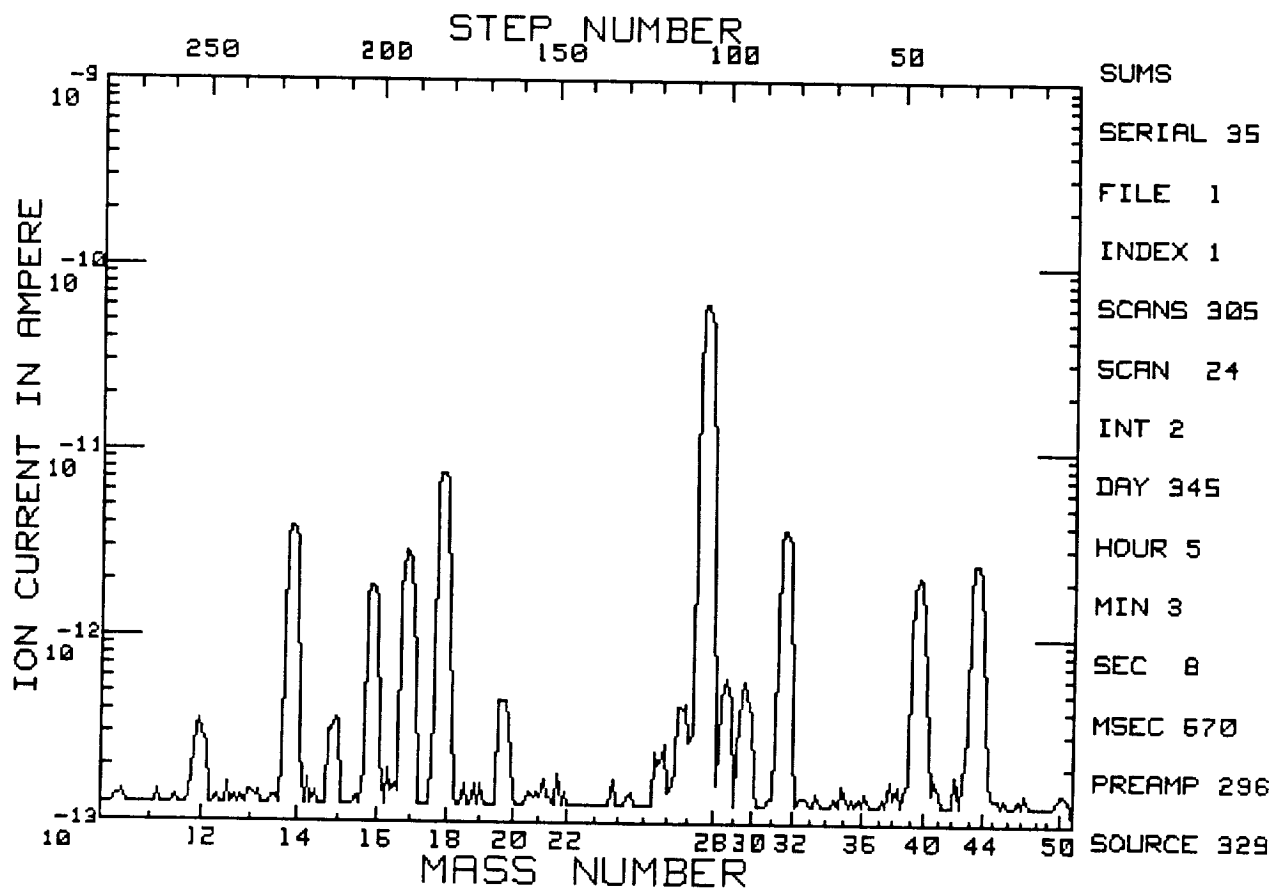
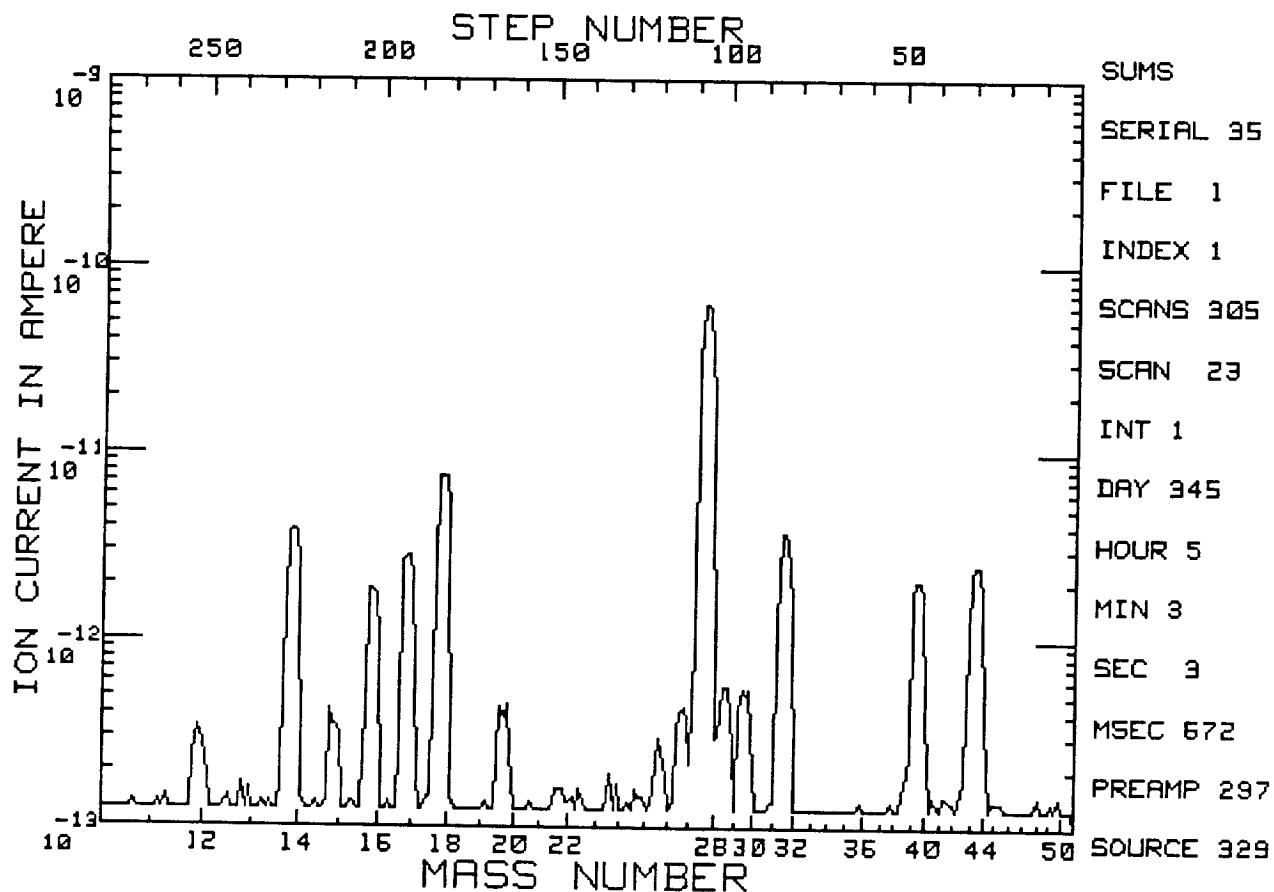


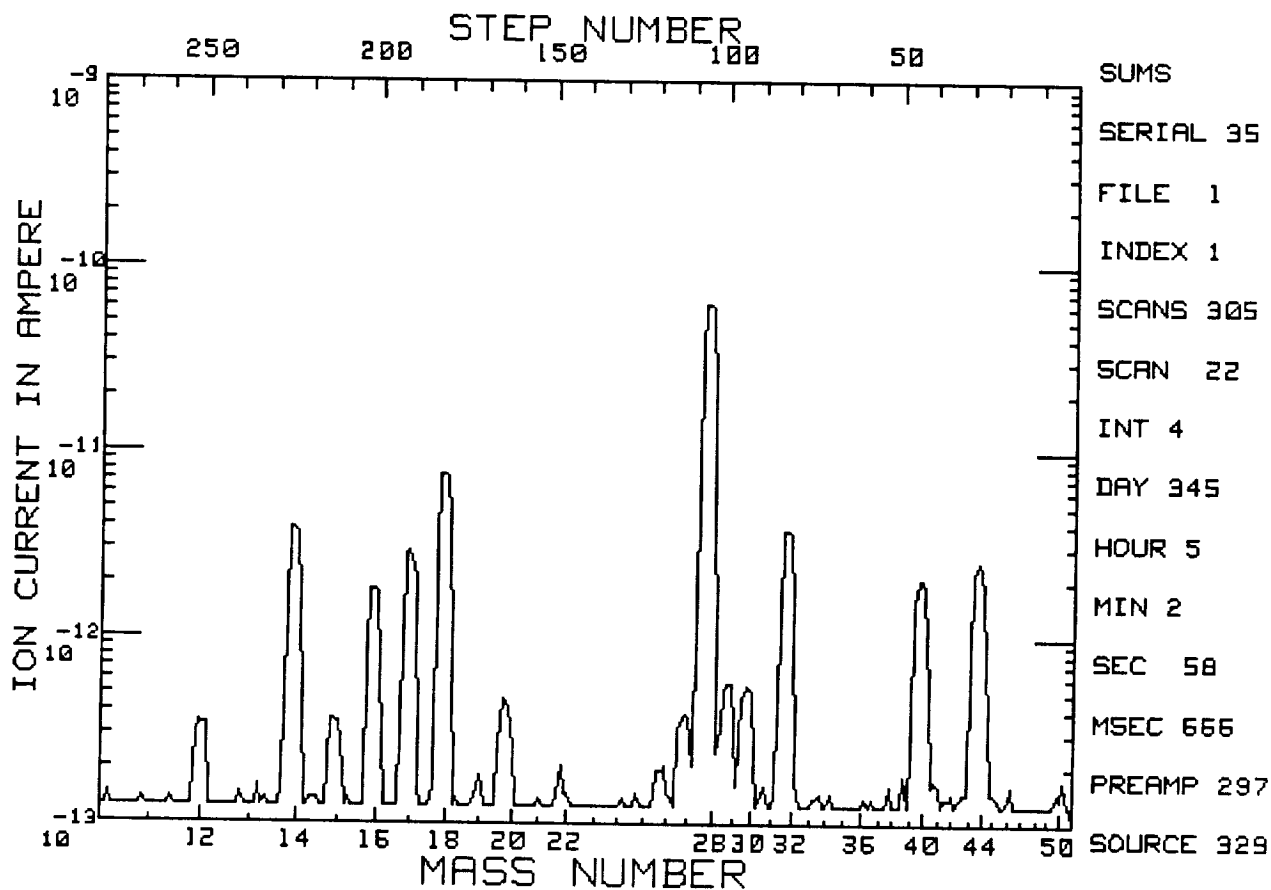
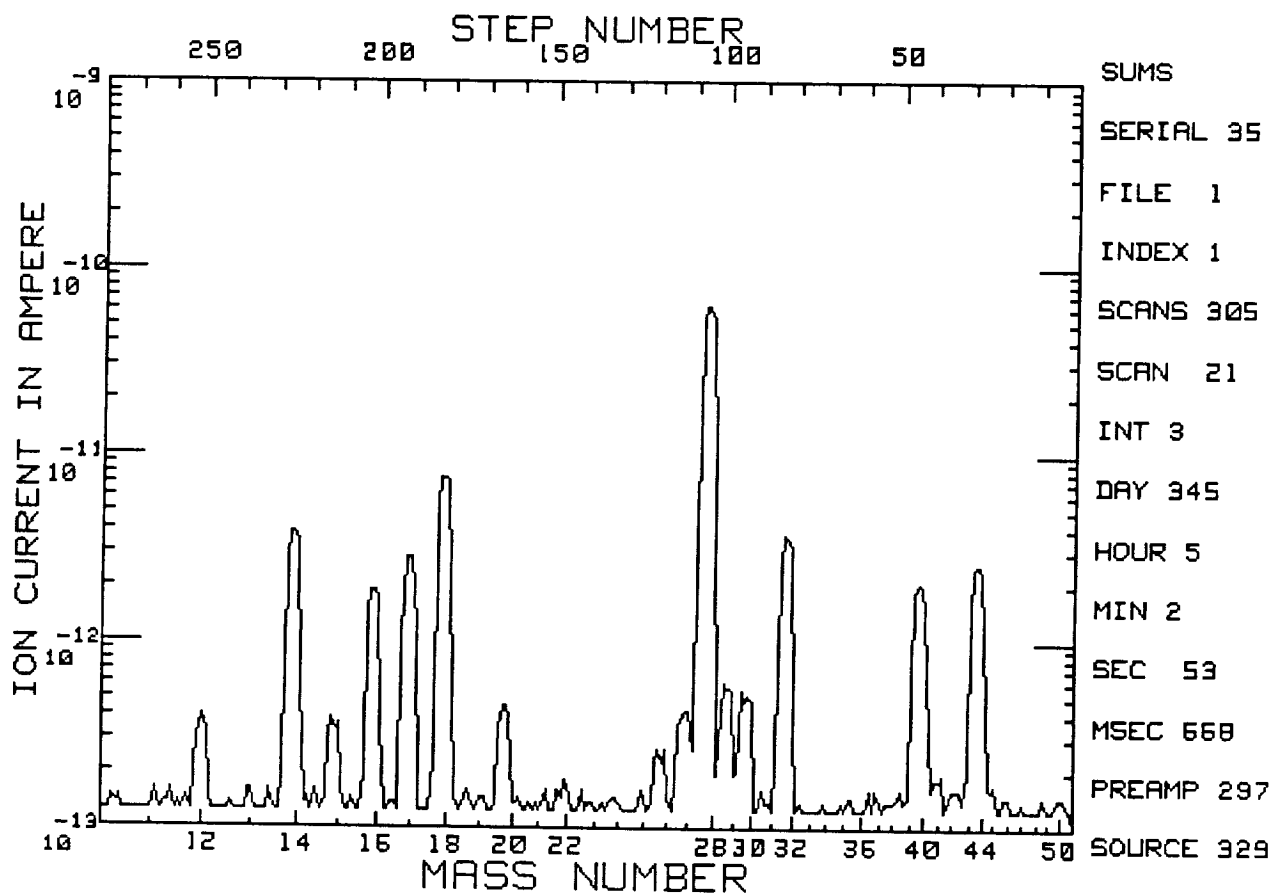


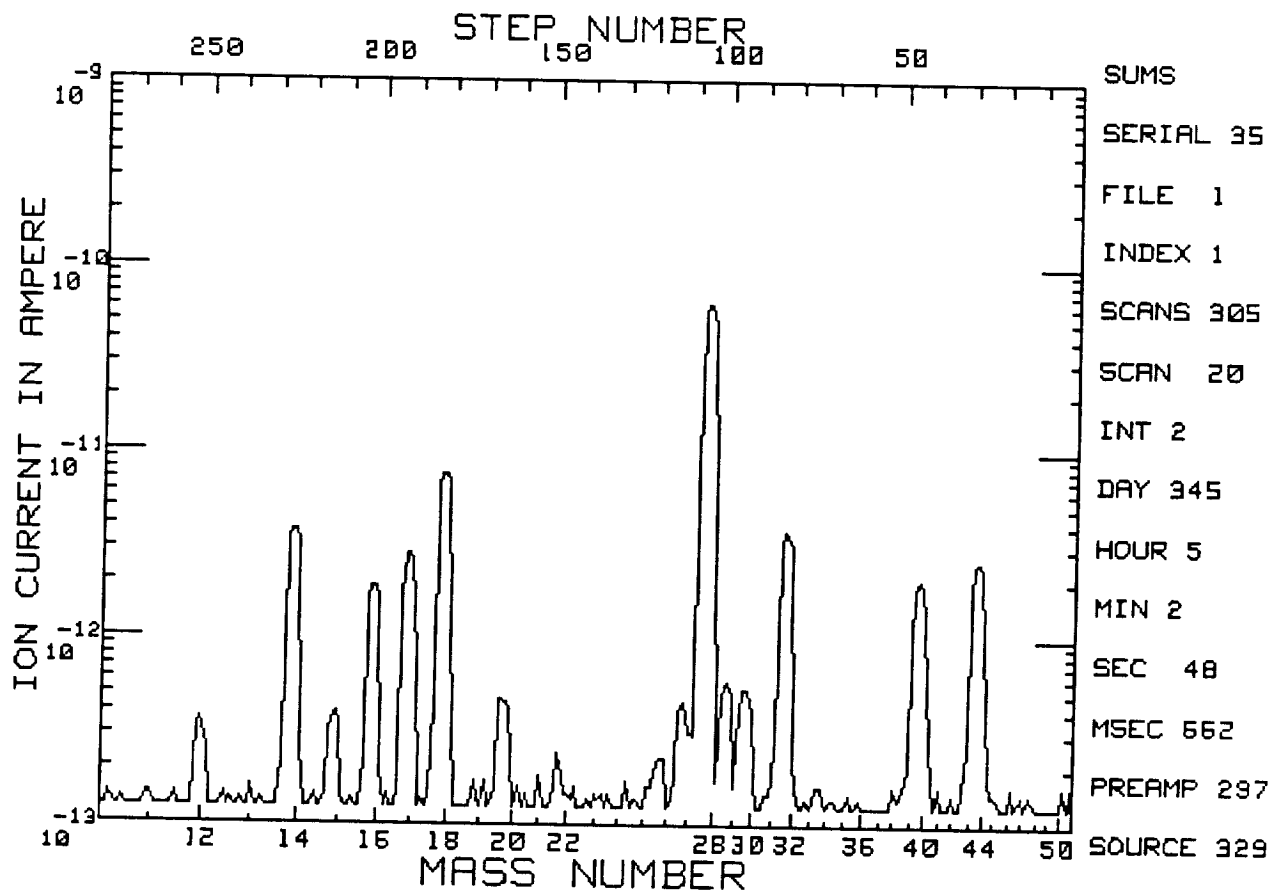
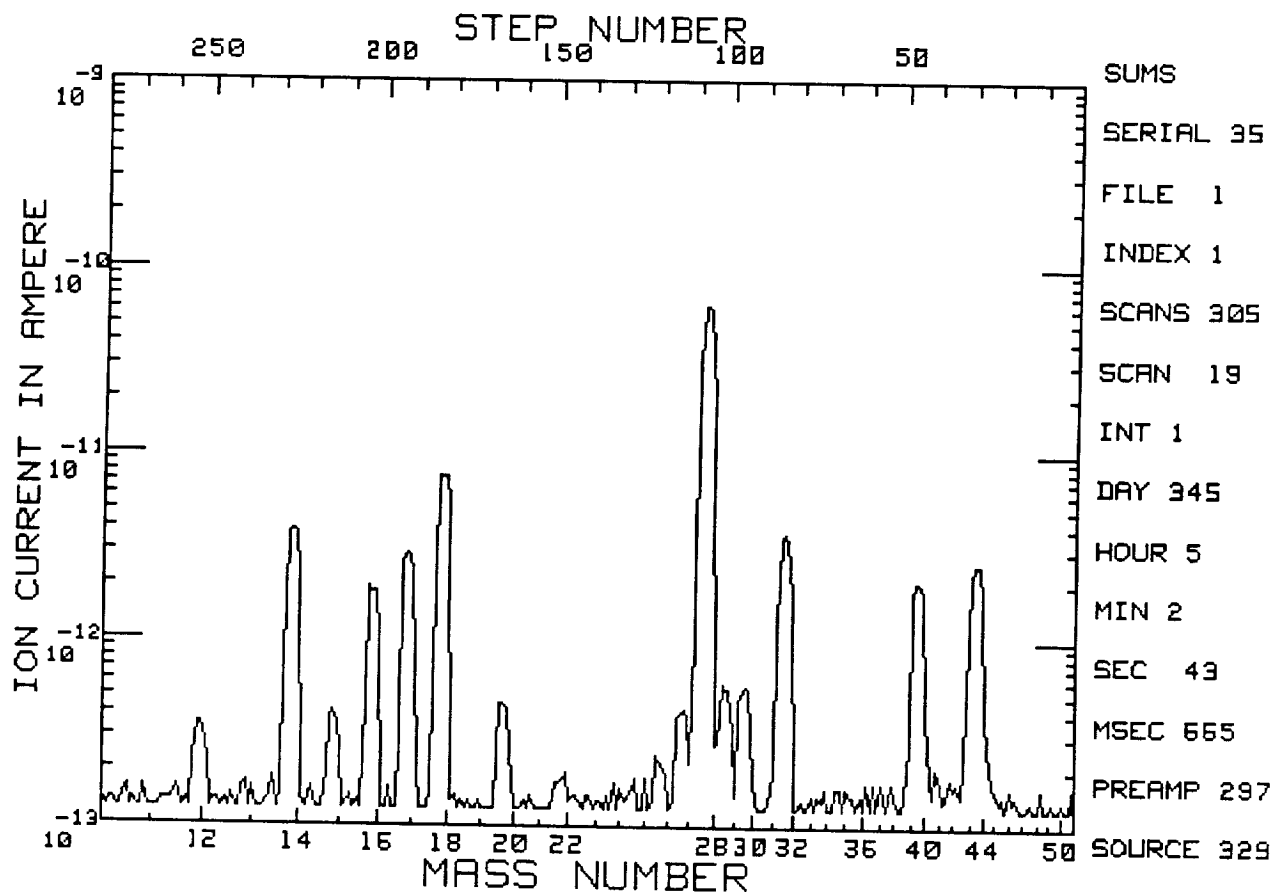
C-2

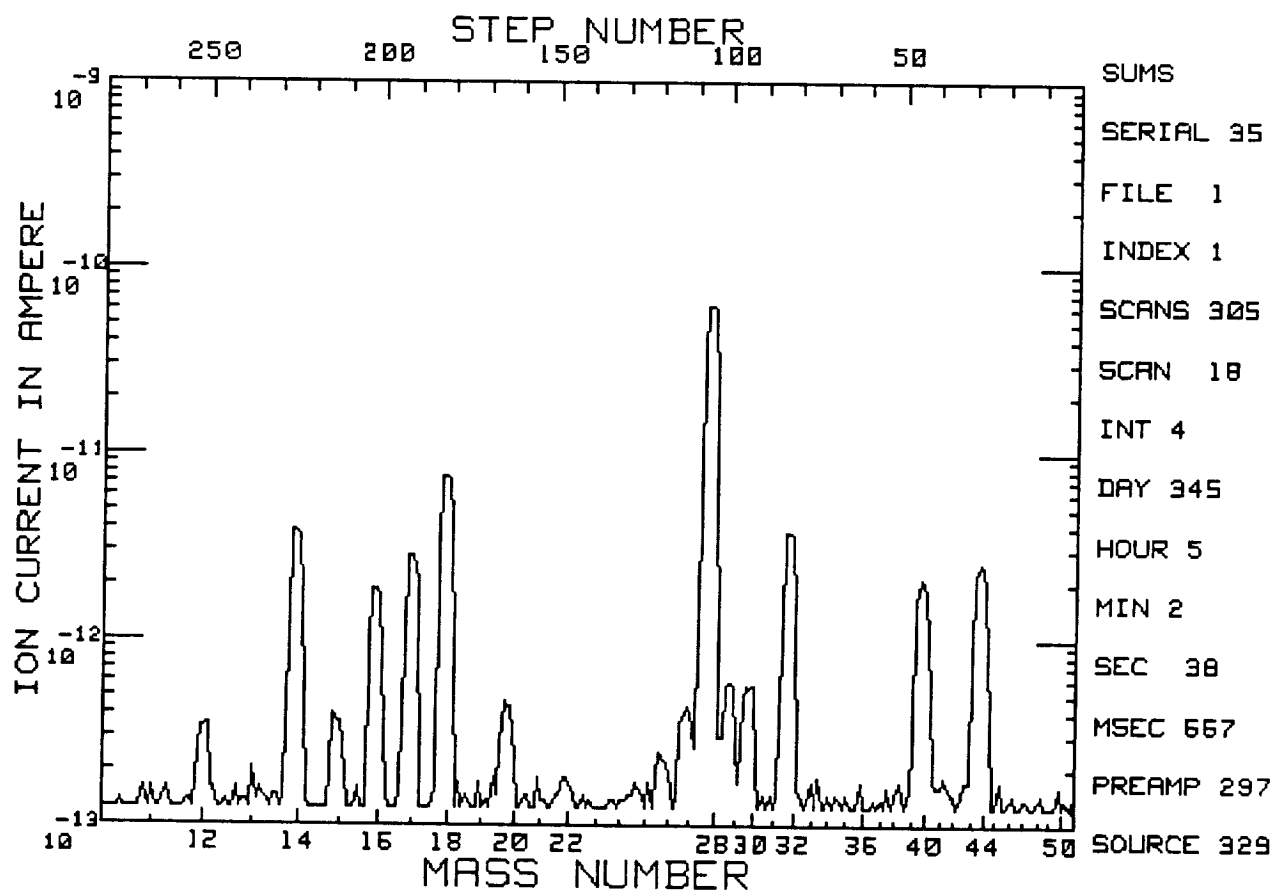
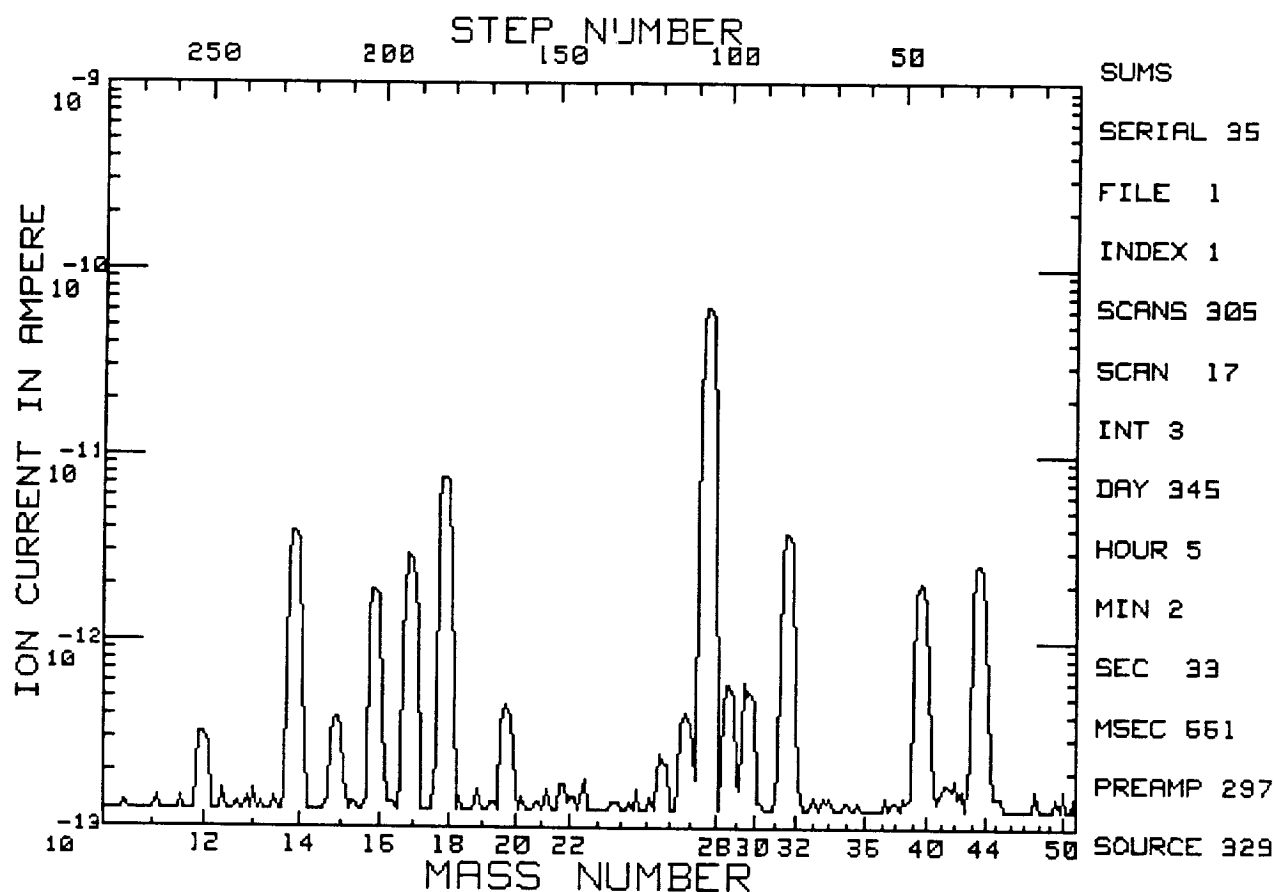


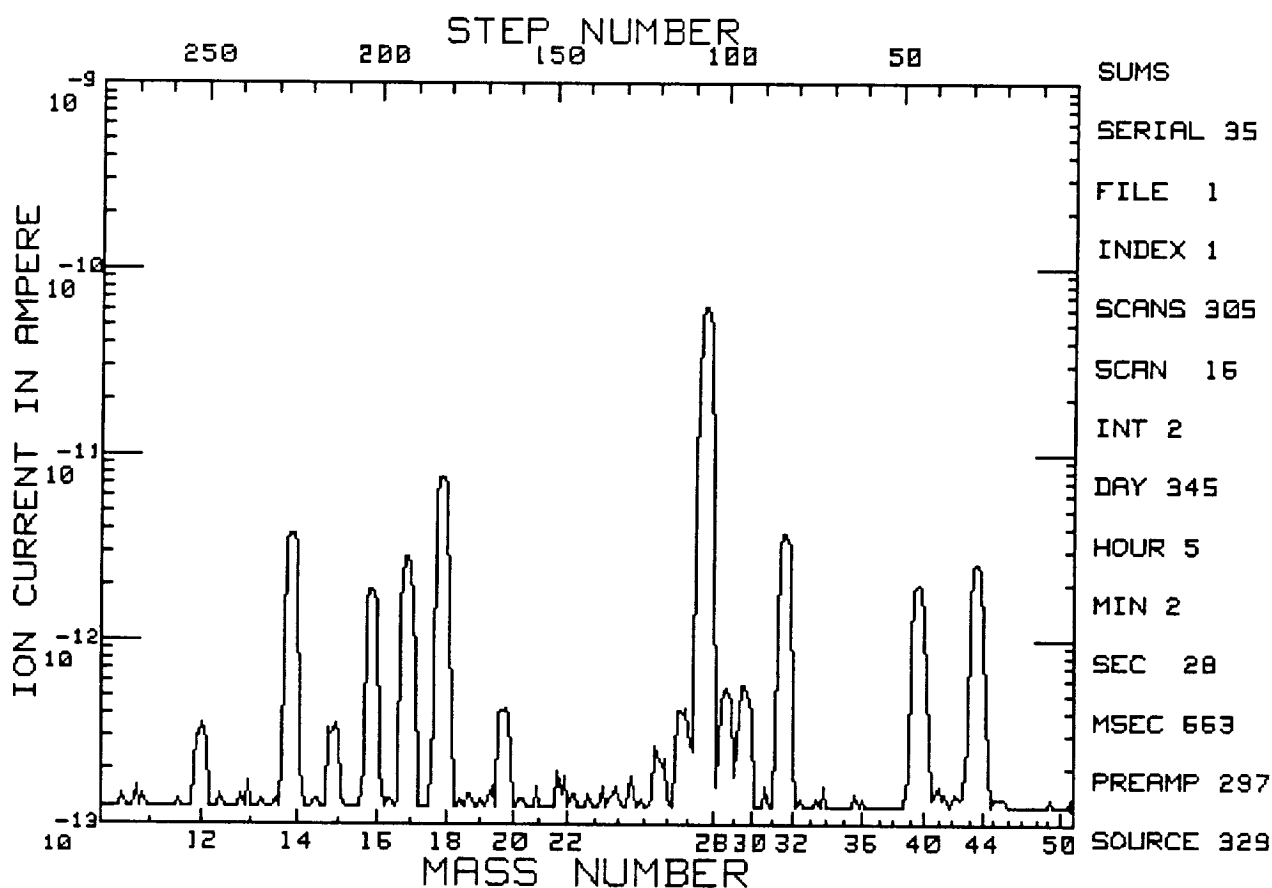
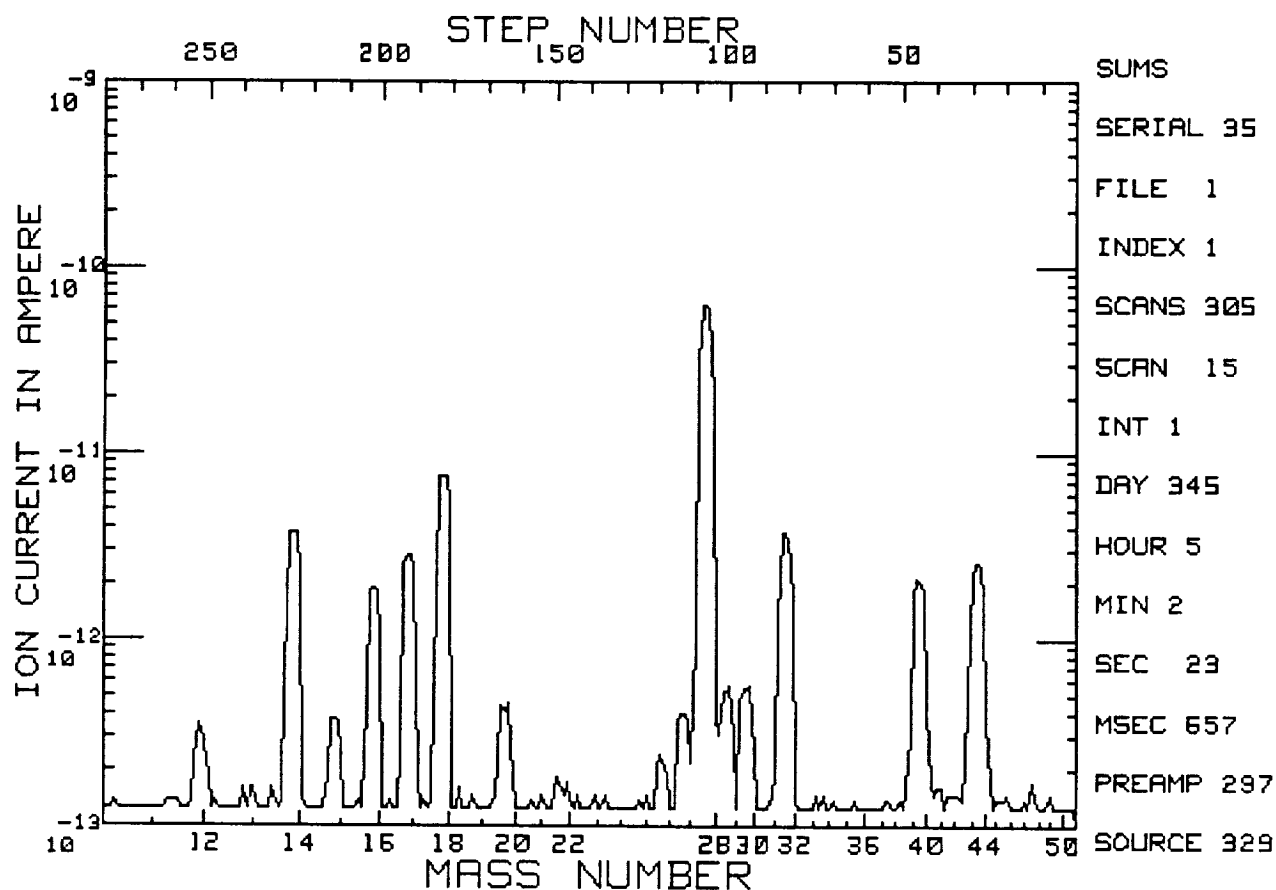


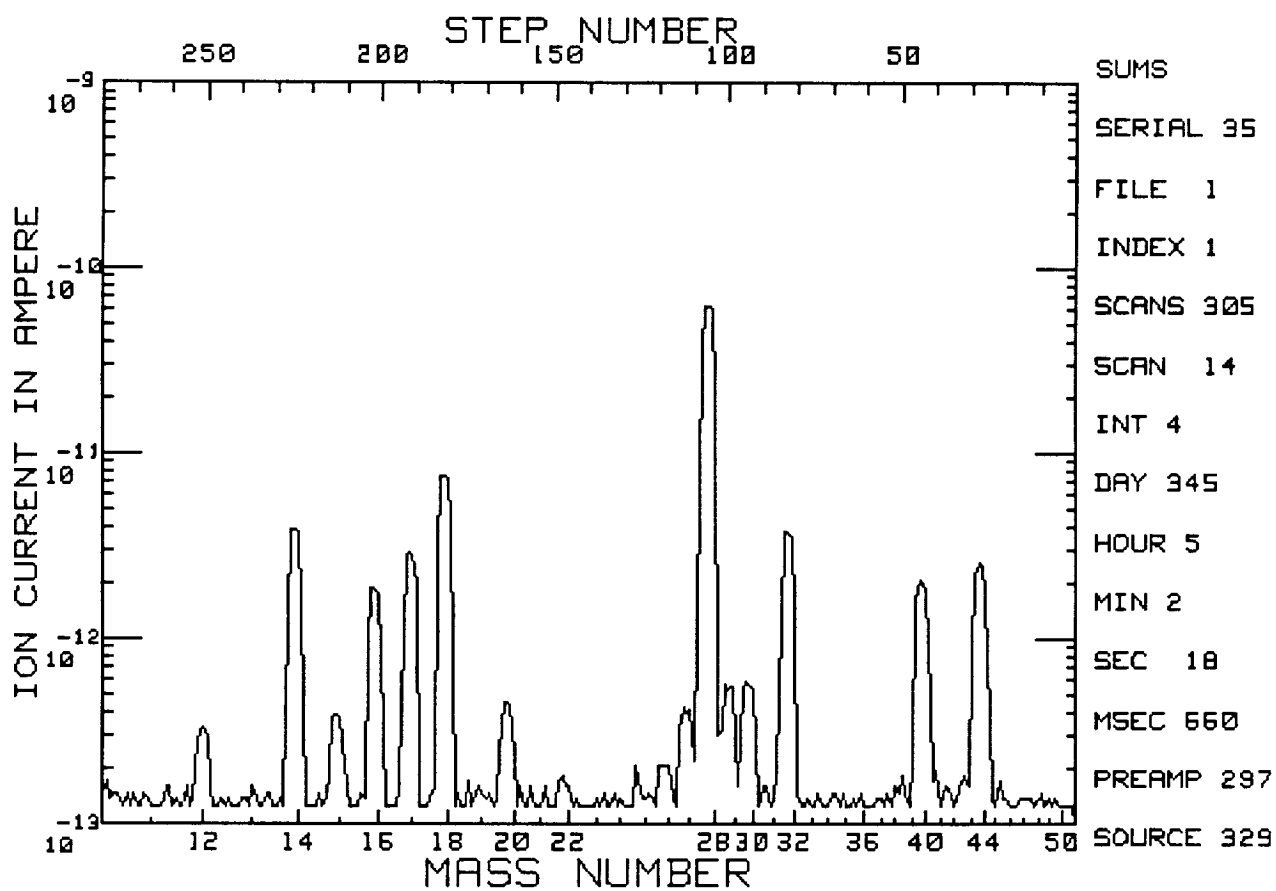
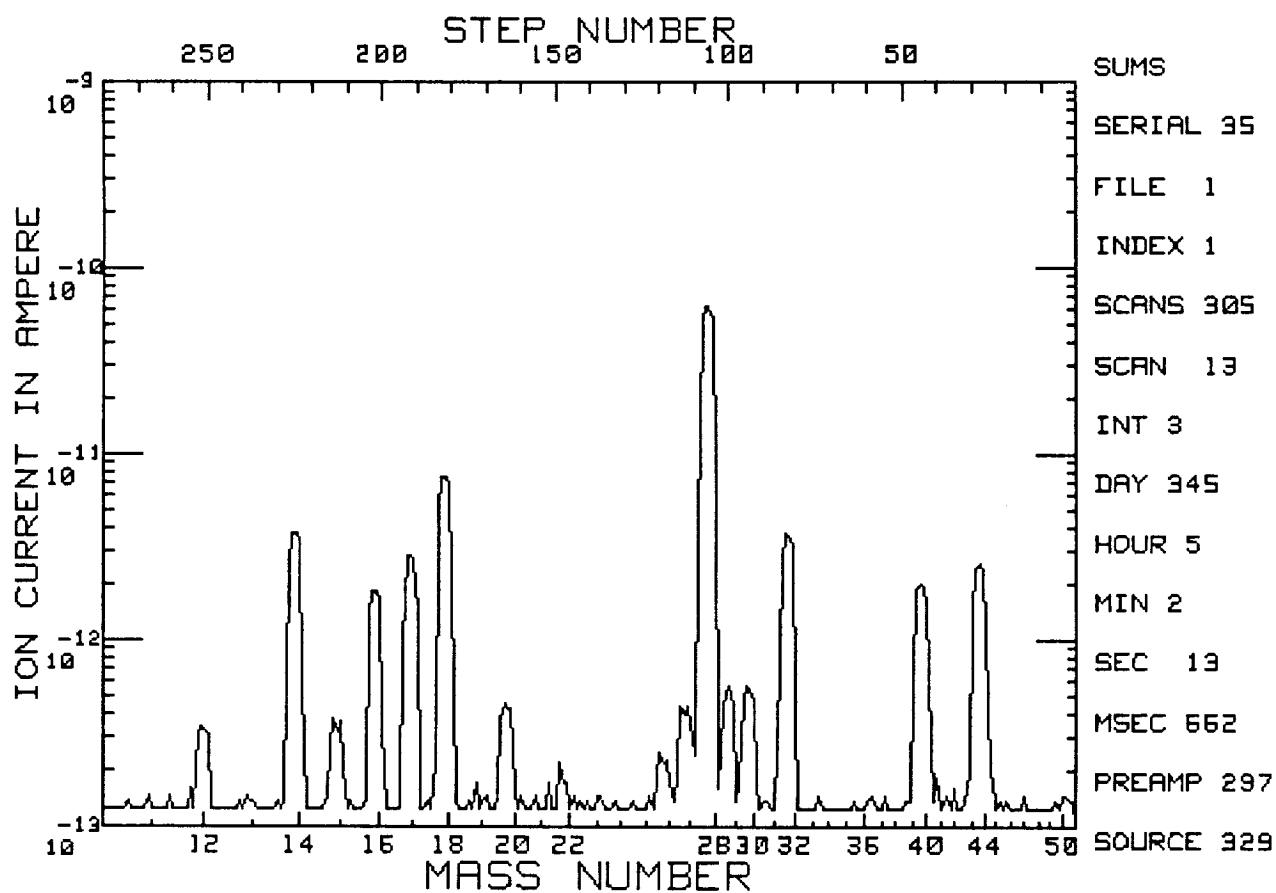


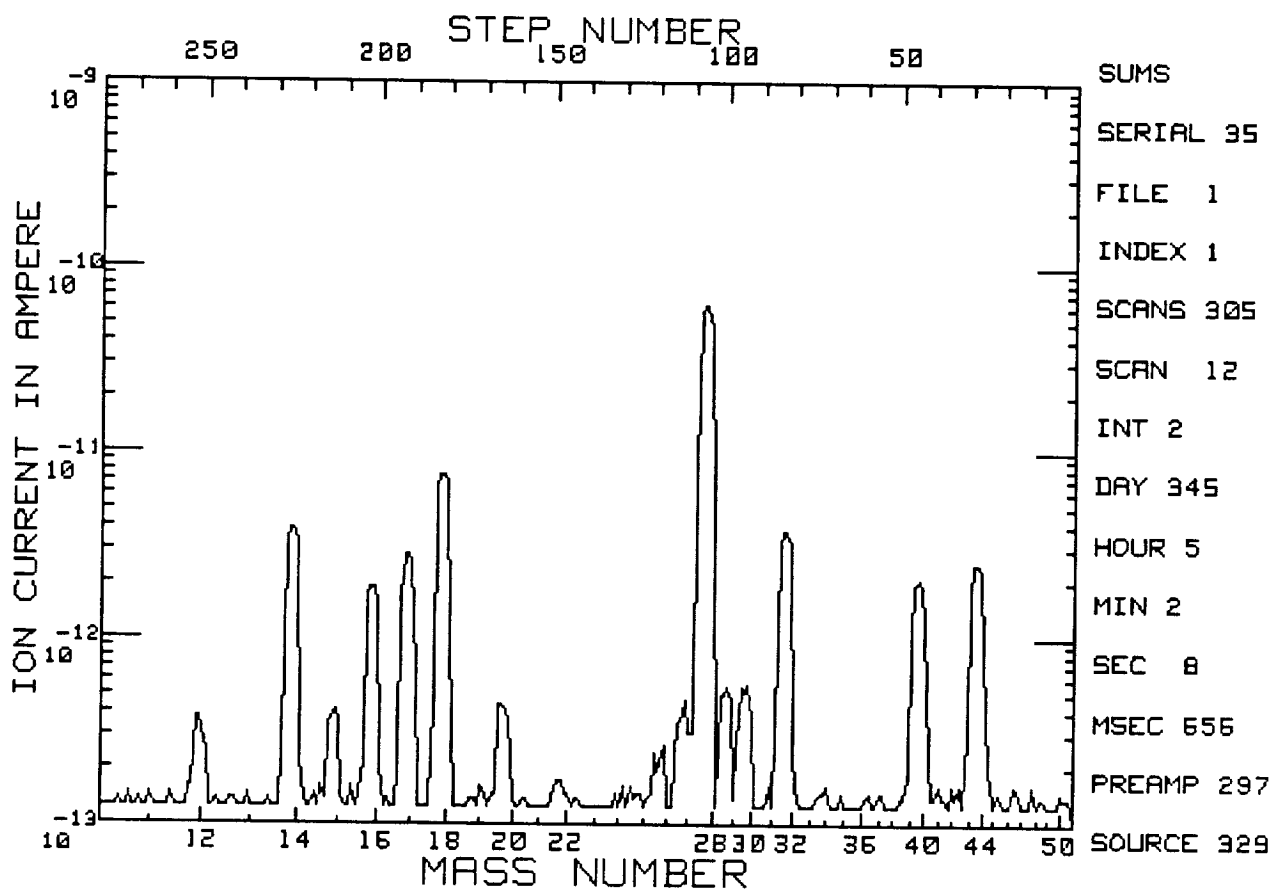
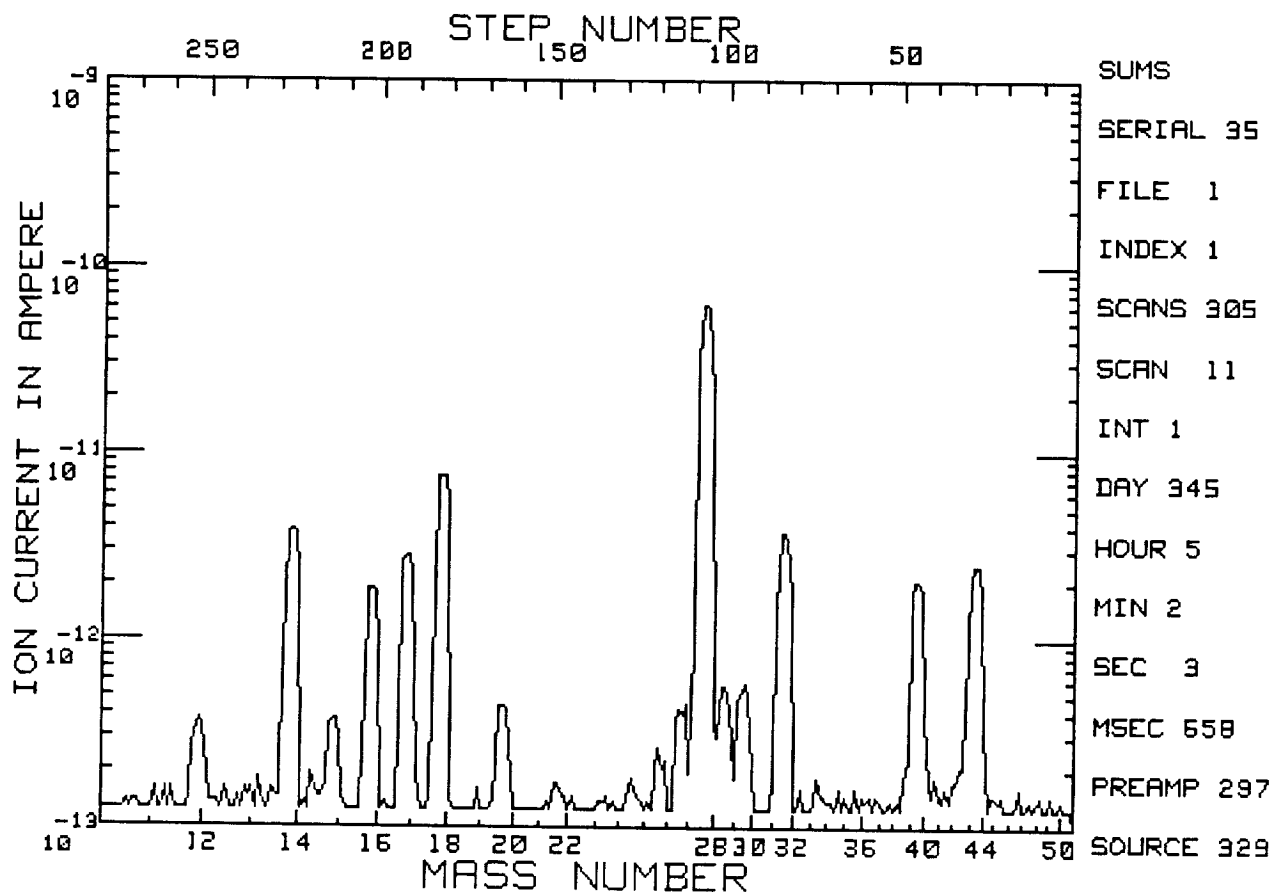


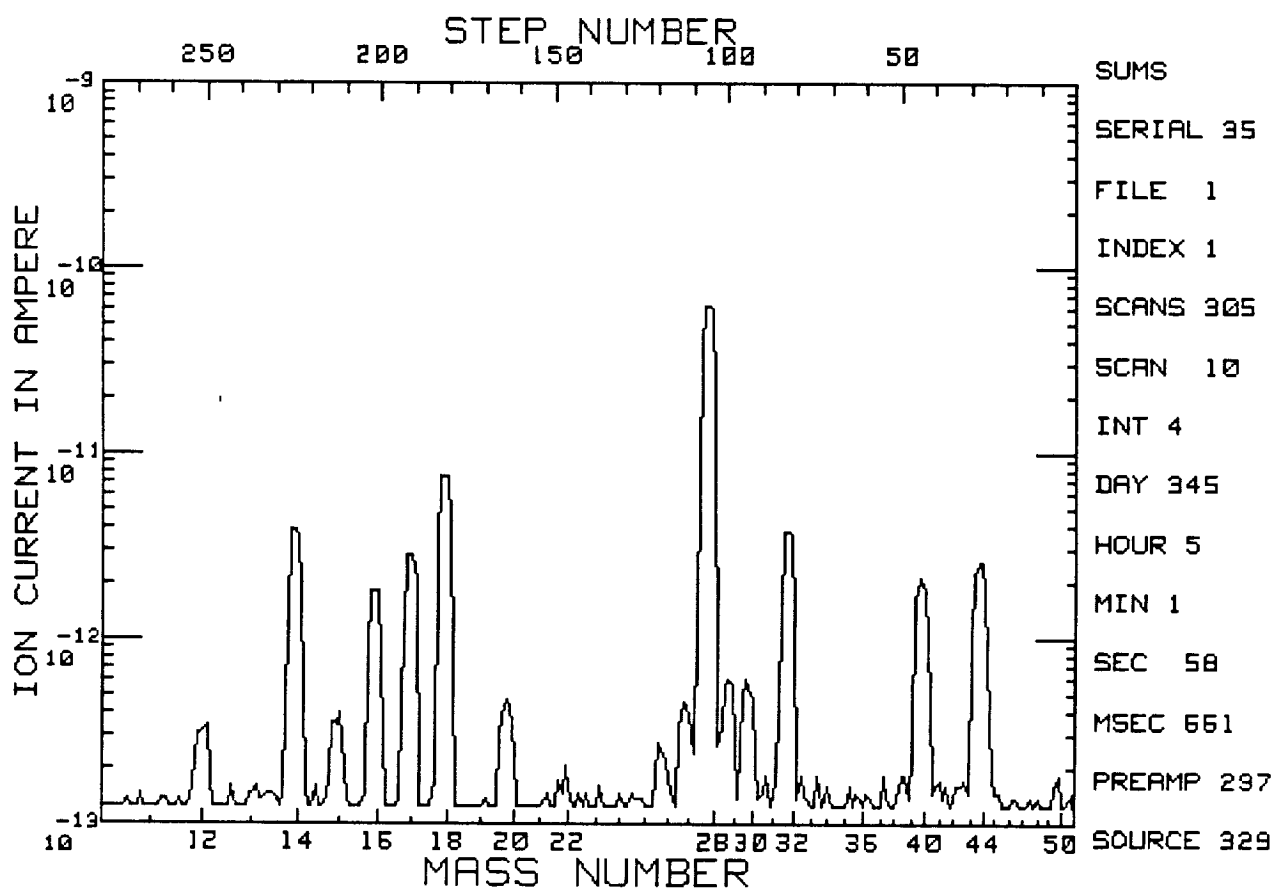
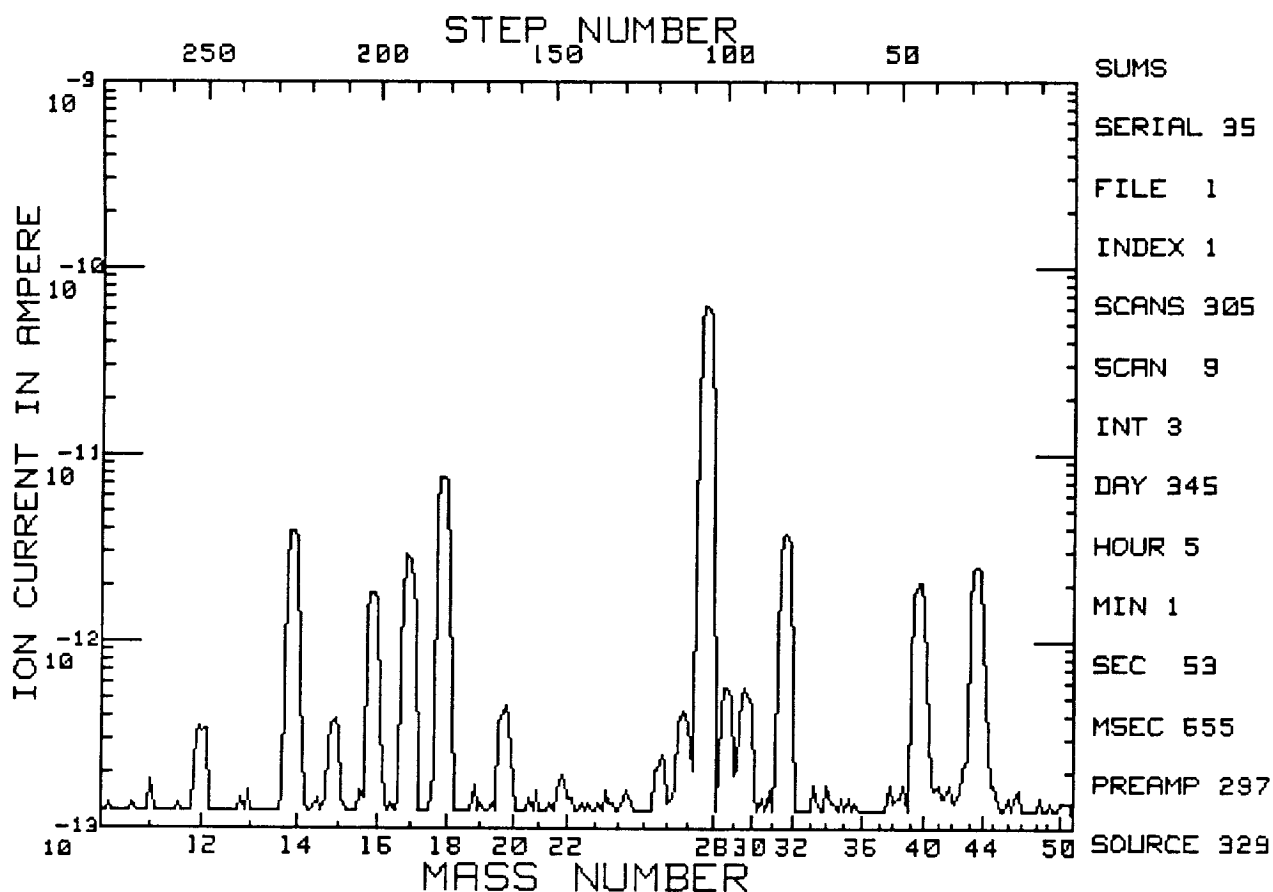


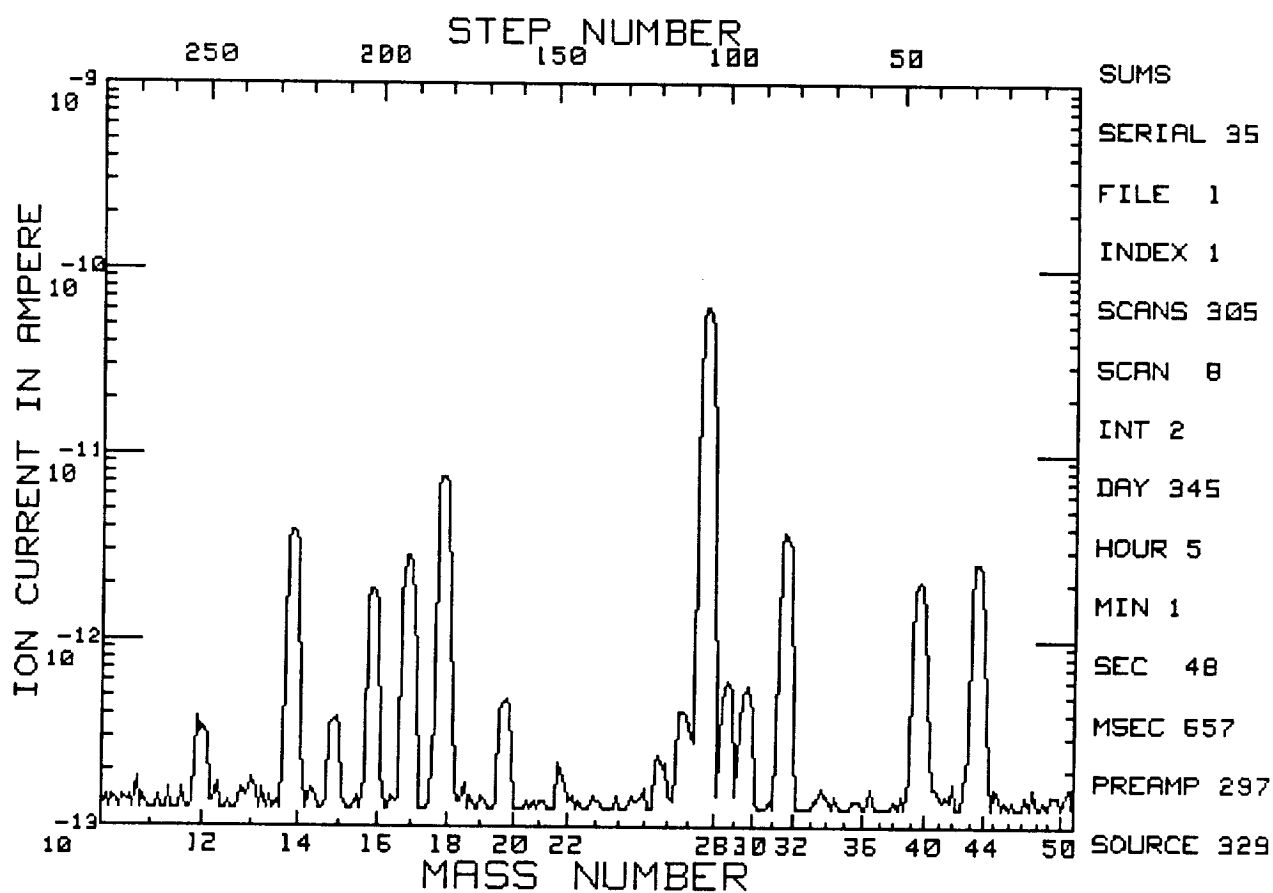
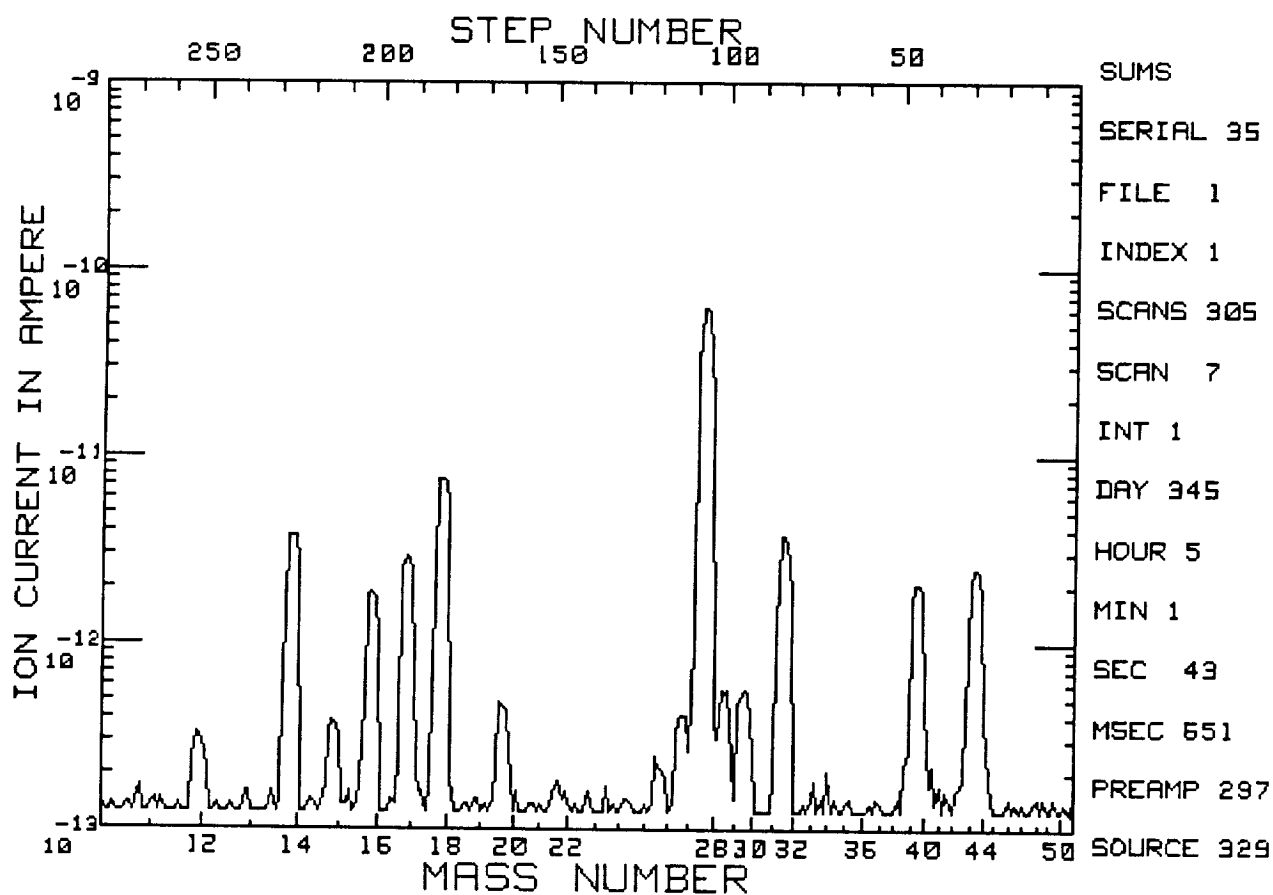


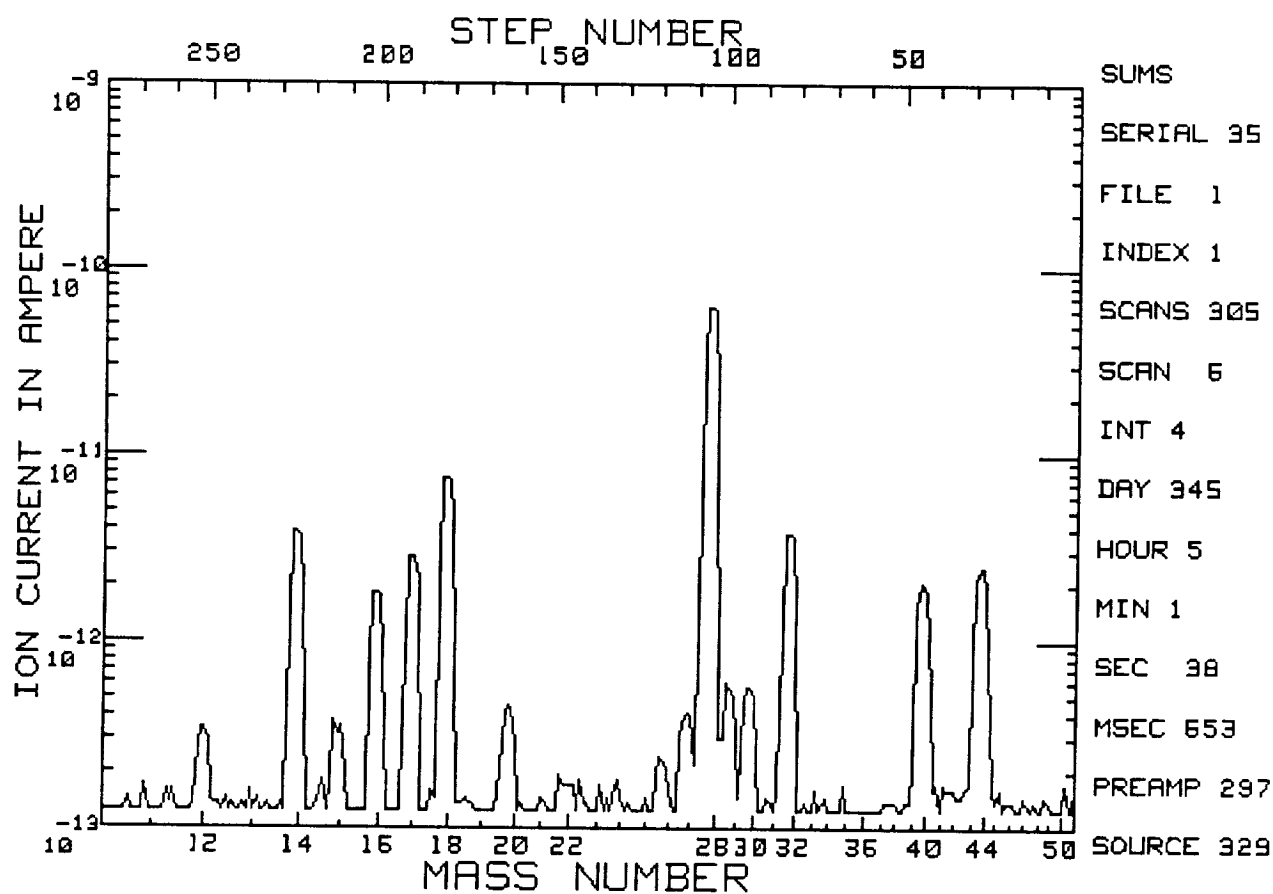
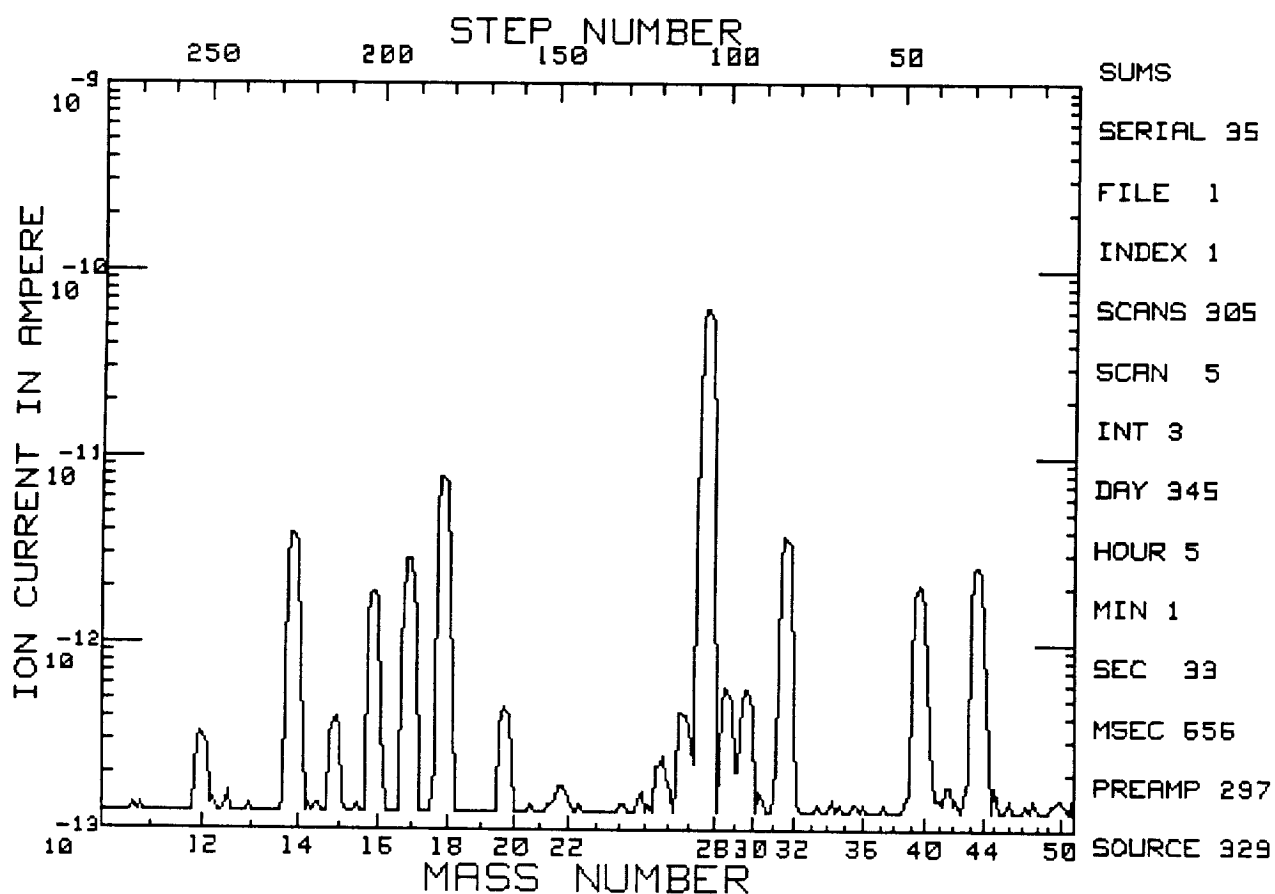


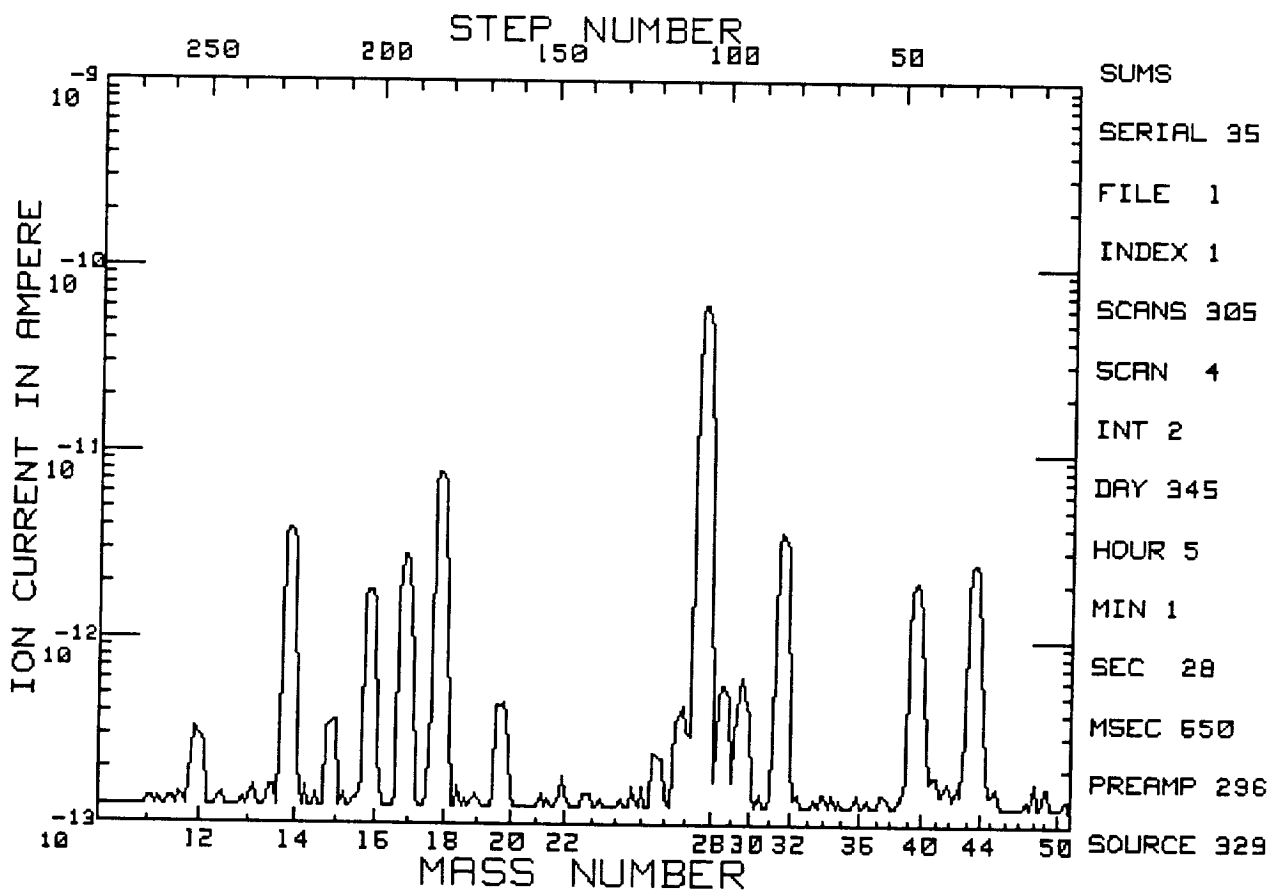
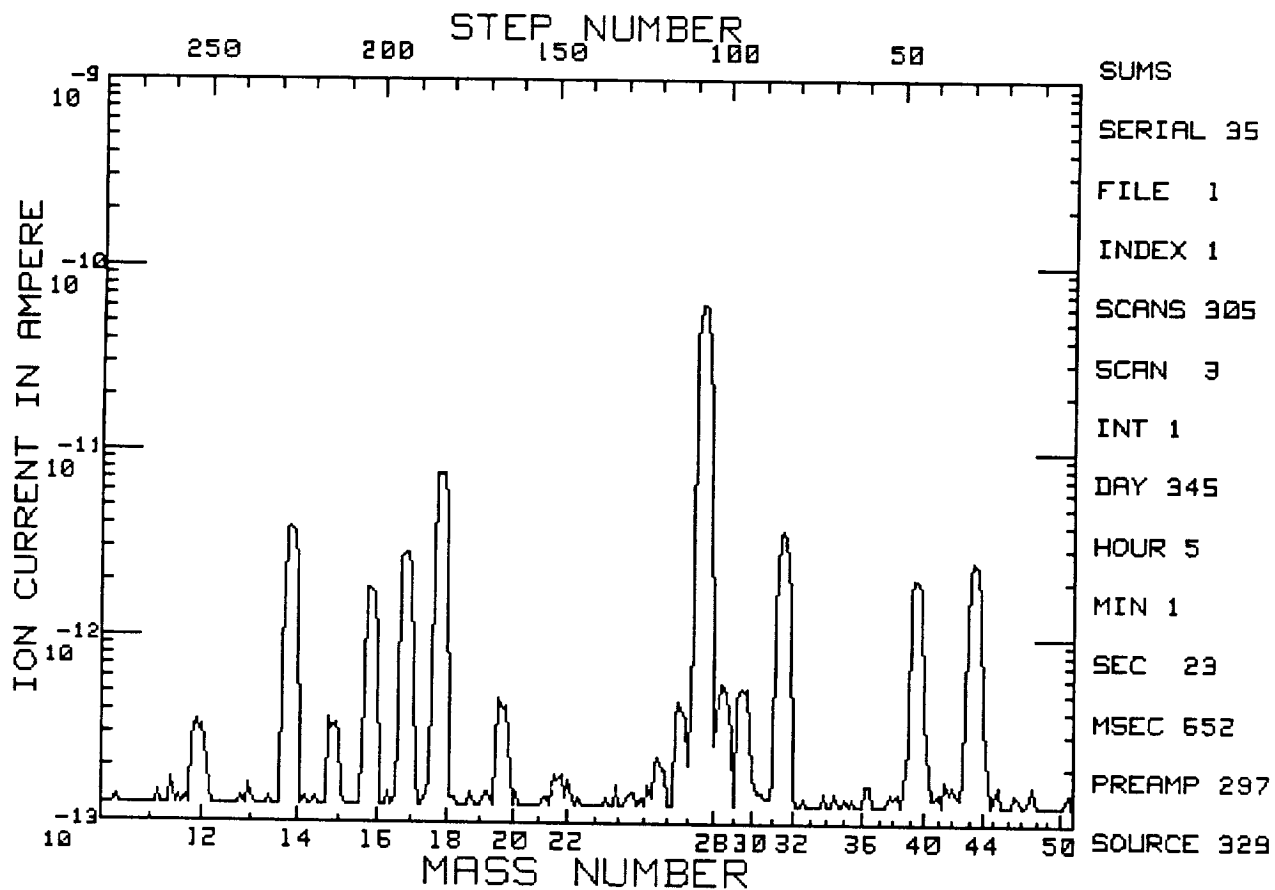


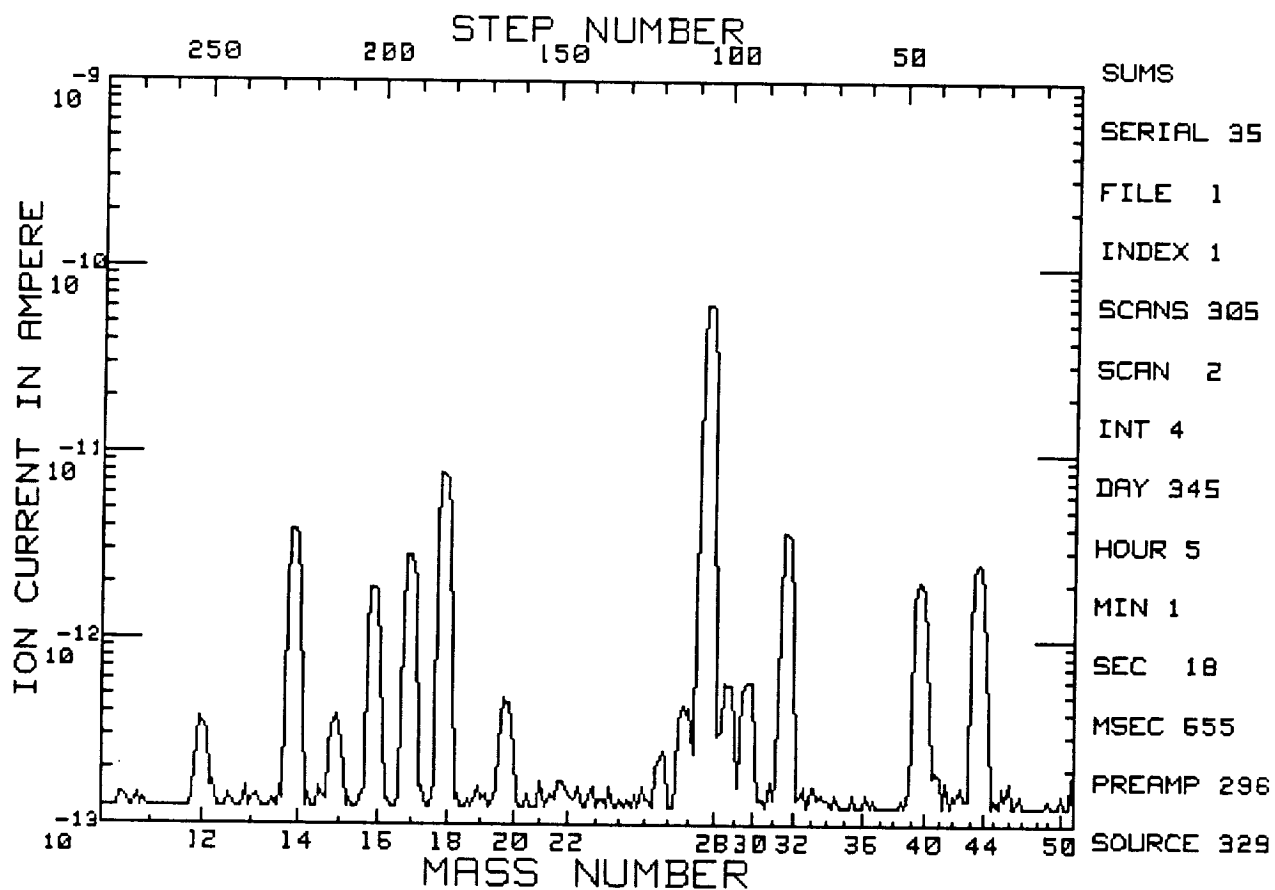
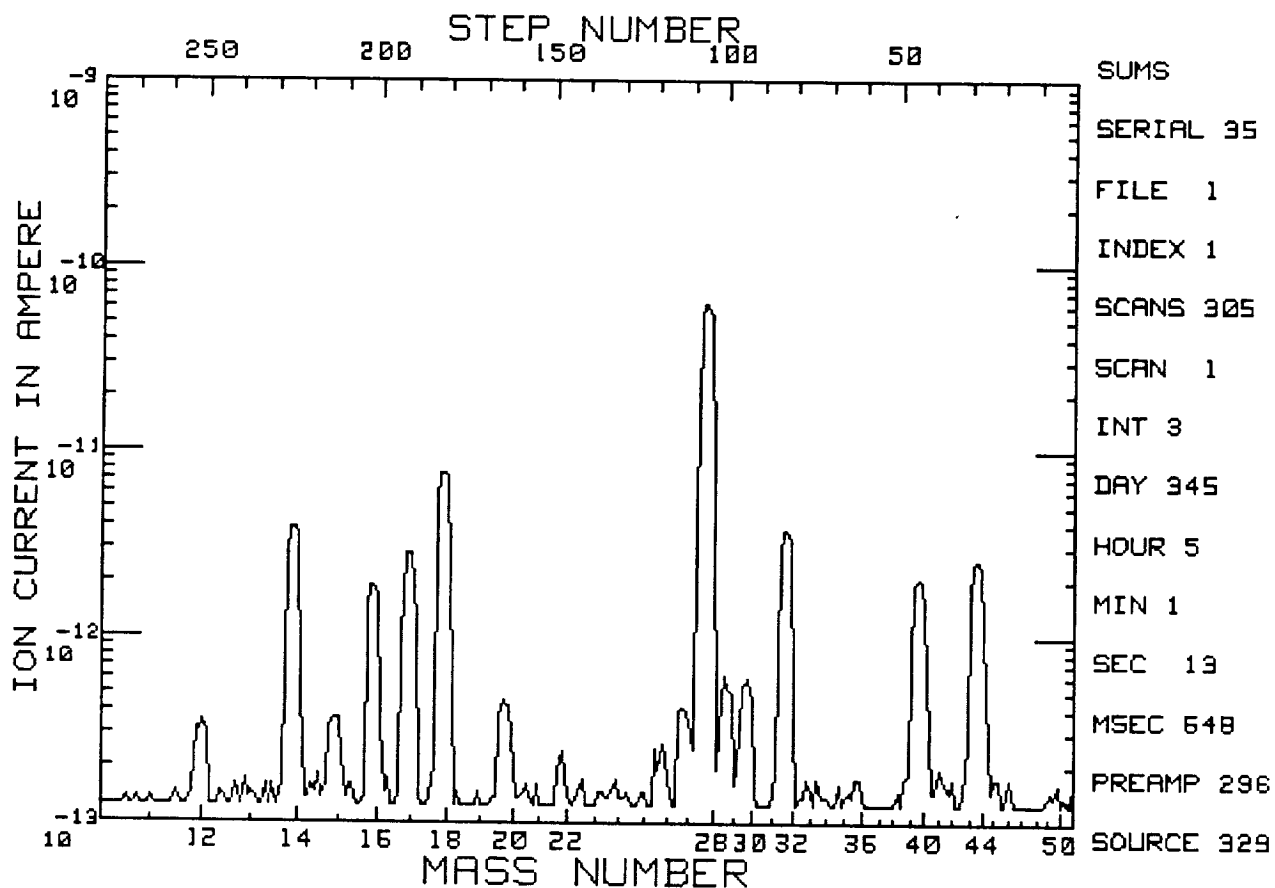


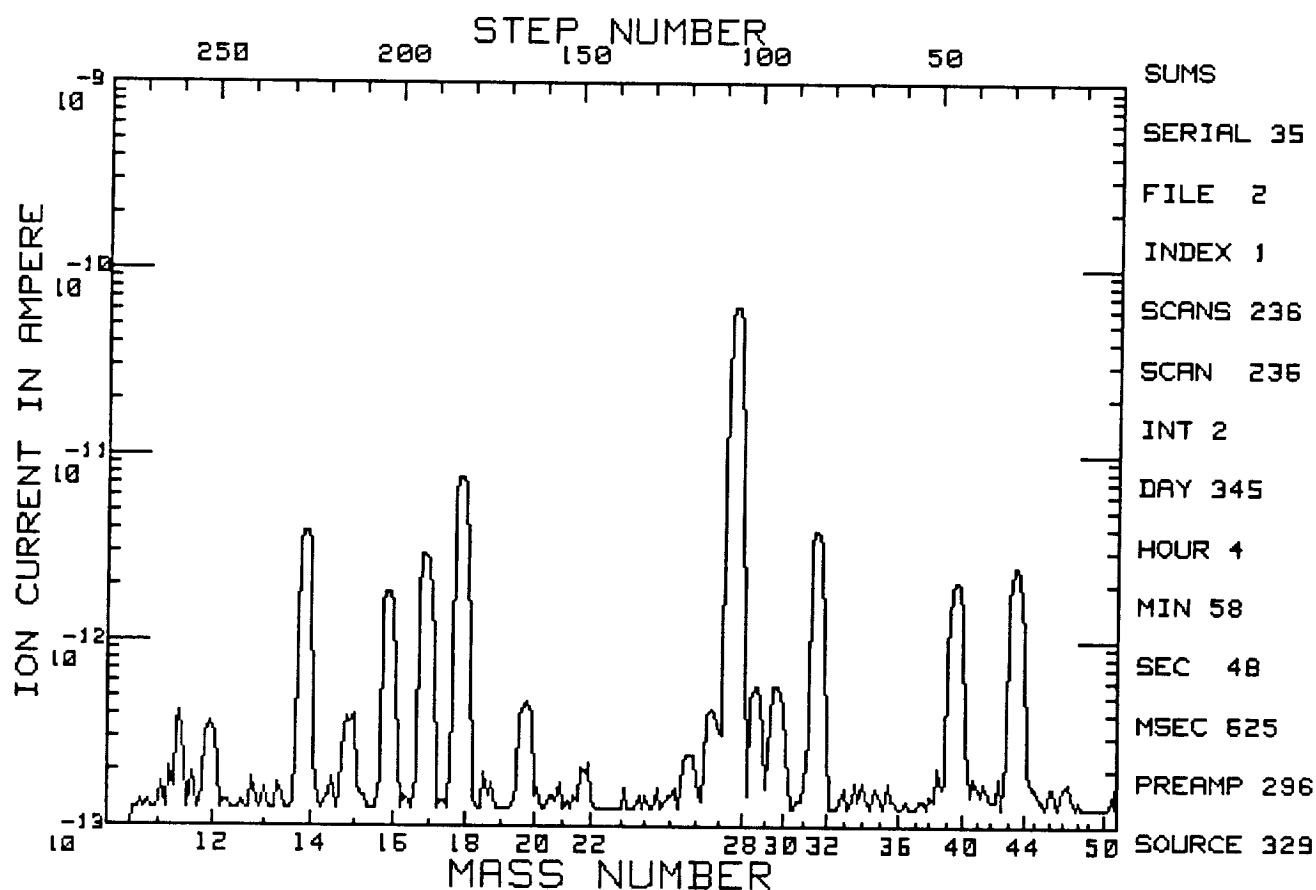
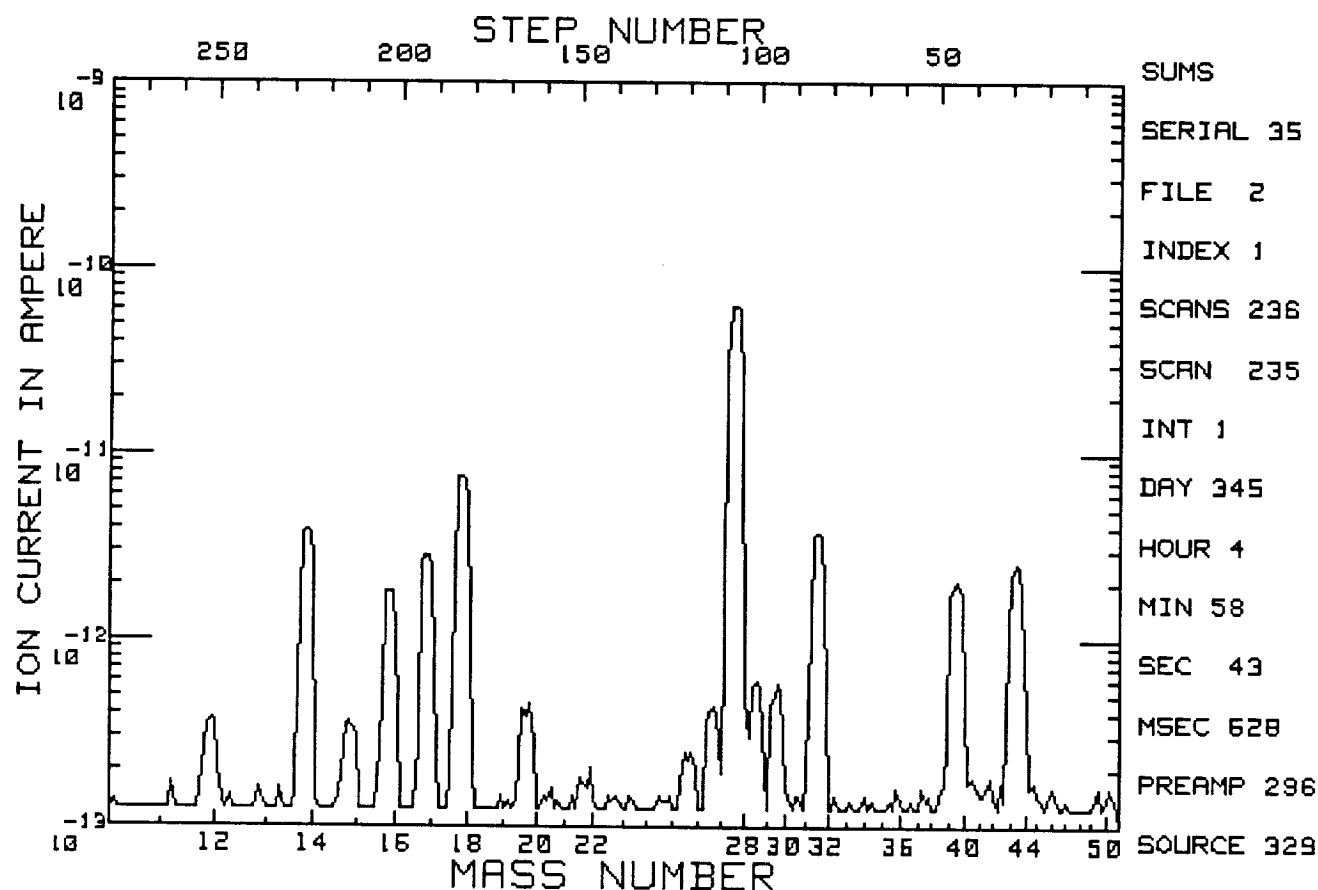


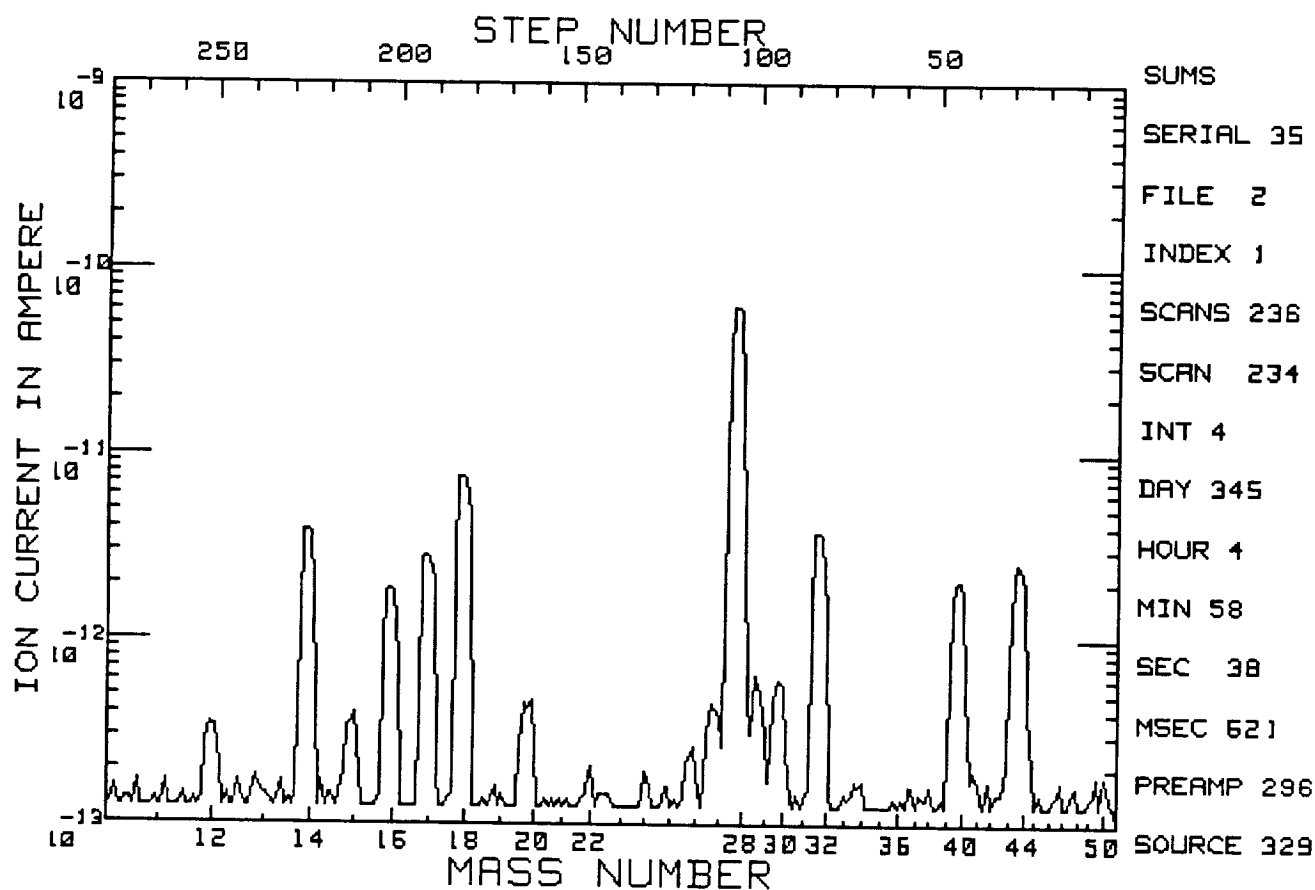
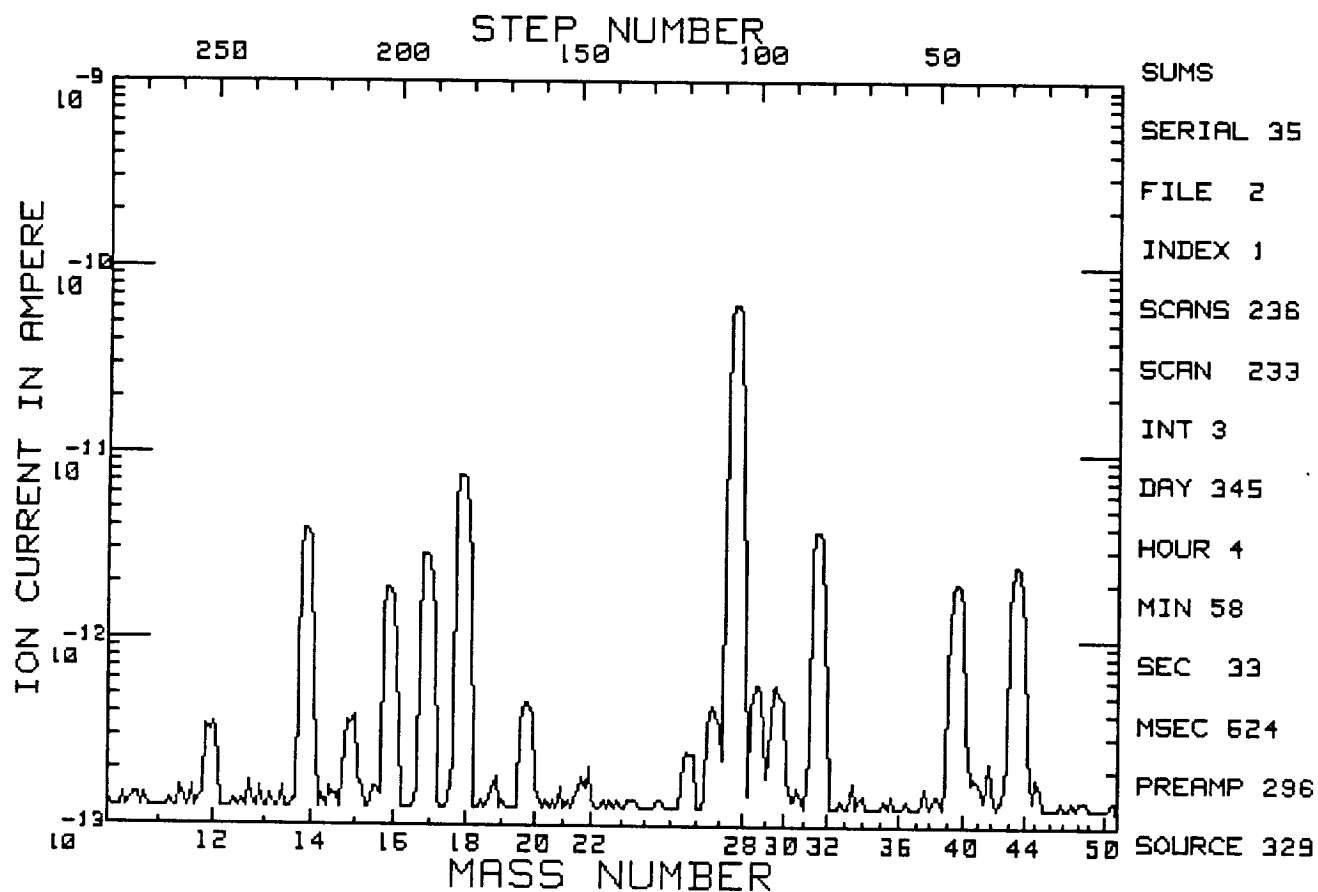


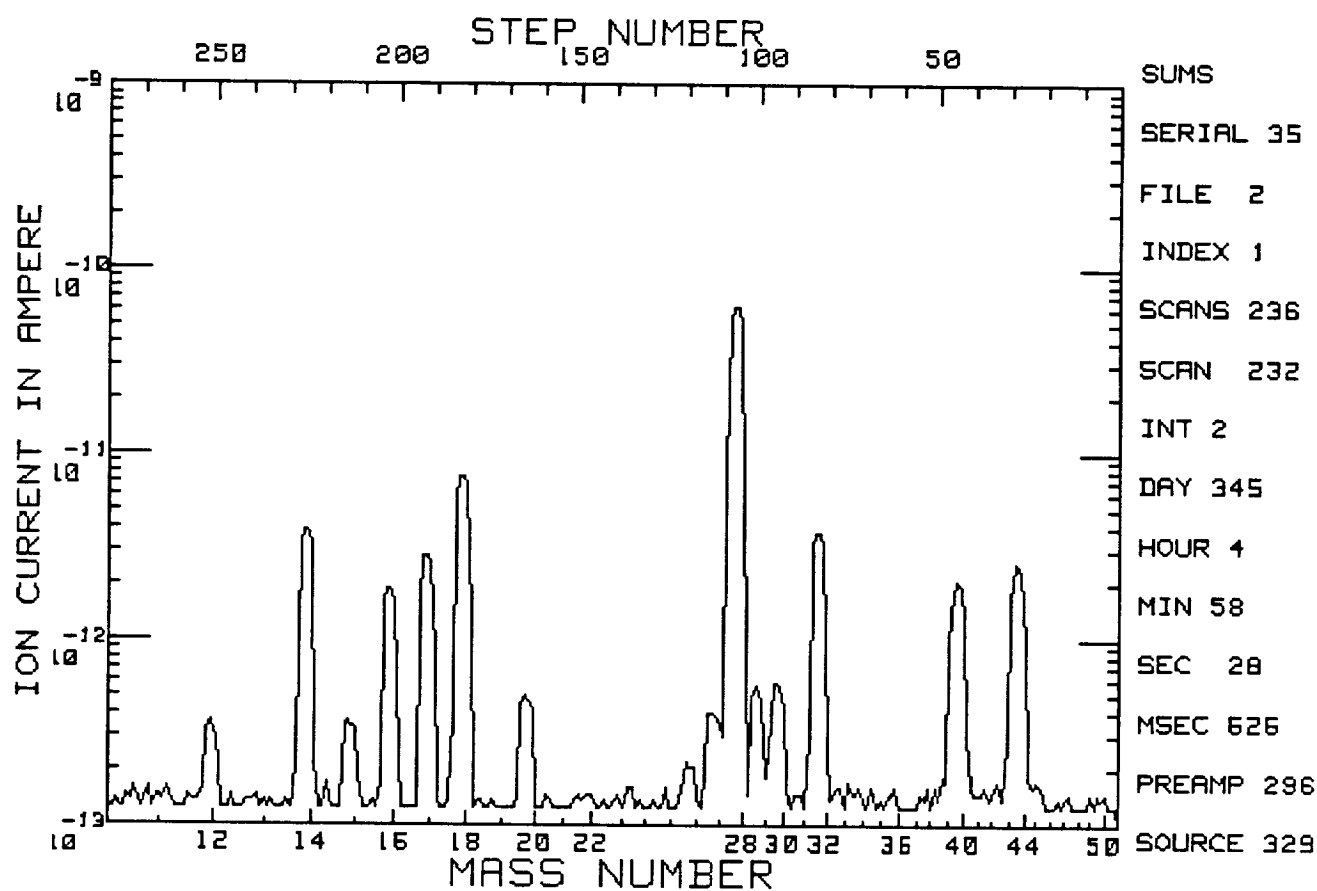
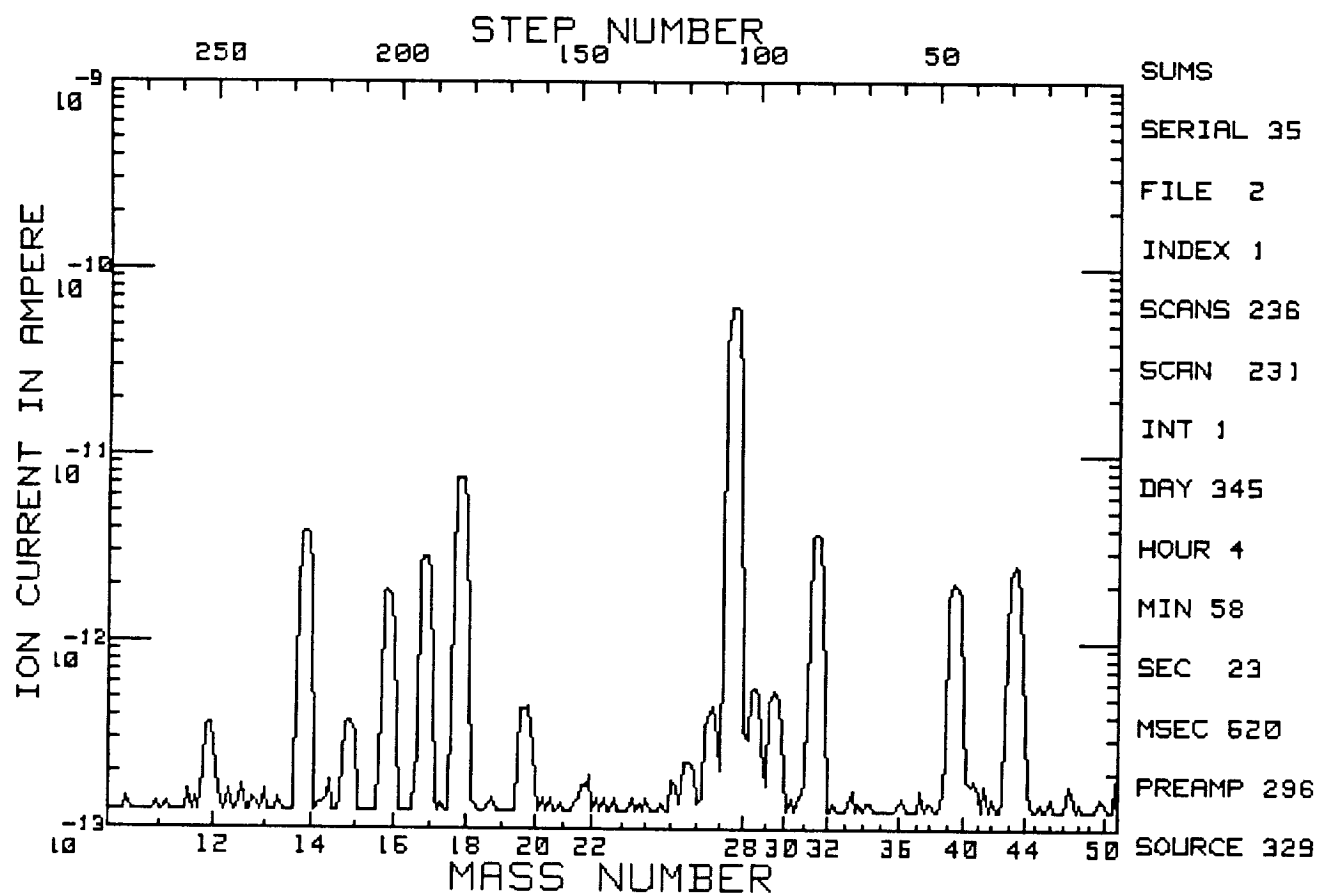


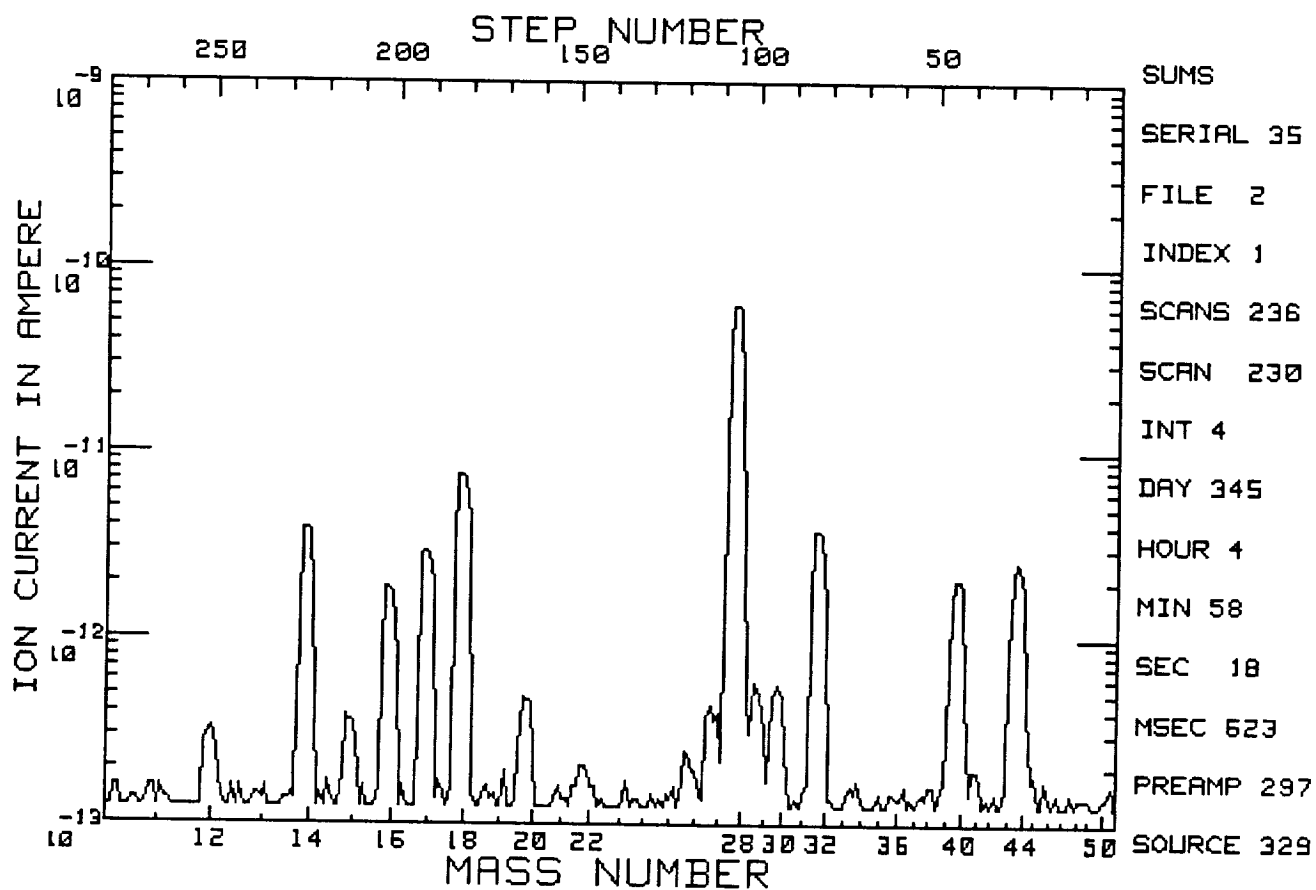
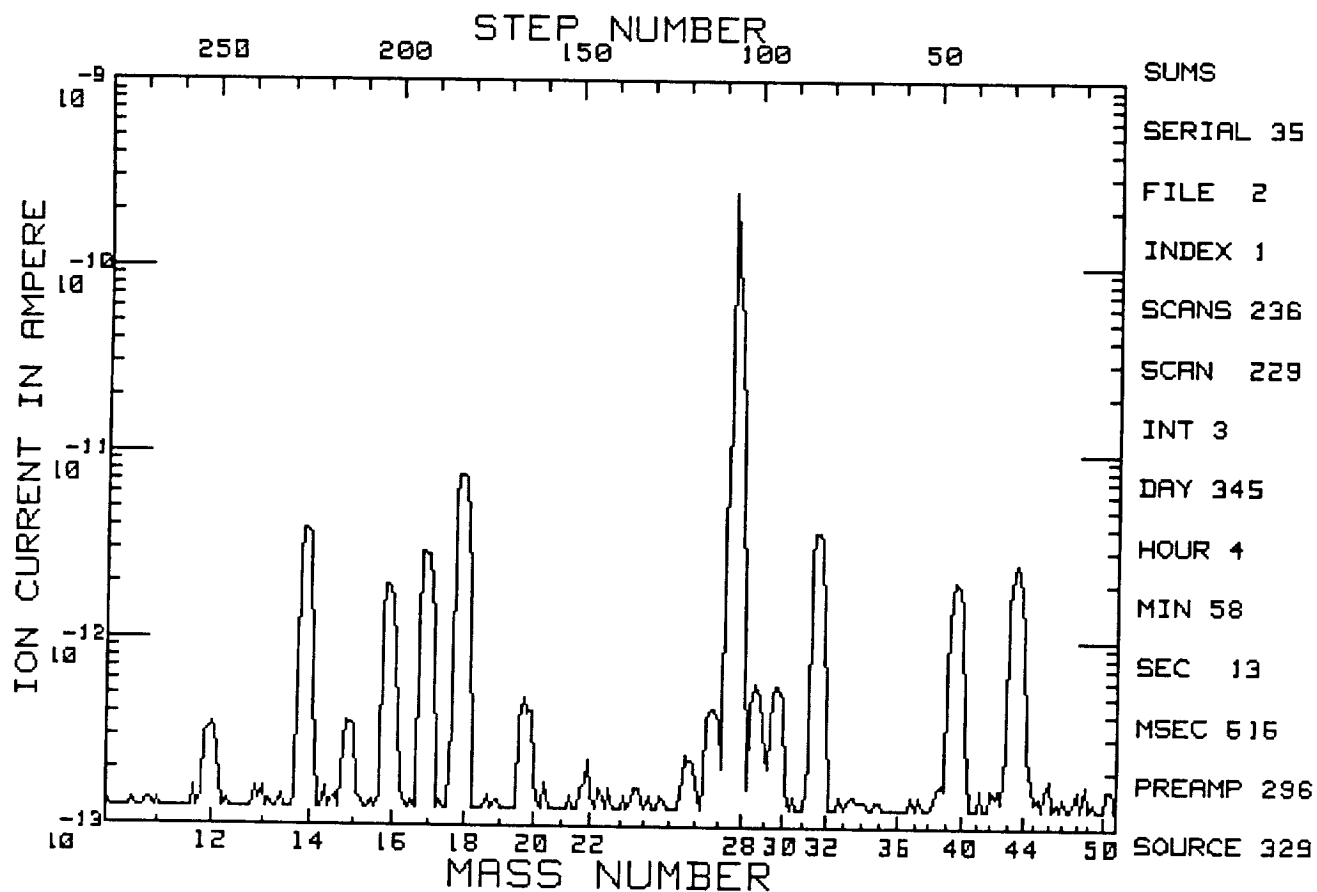


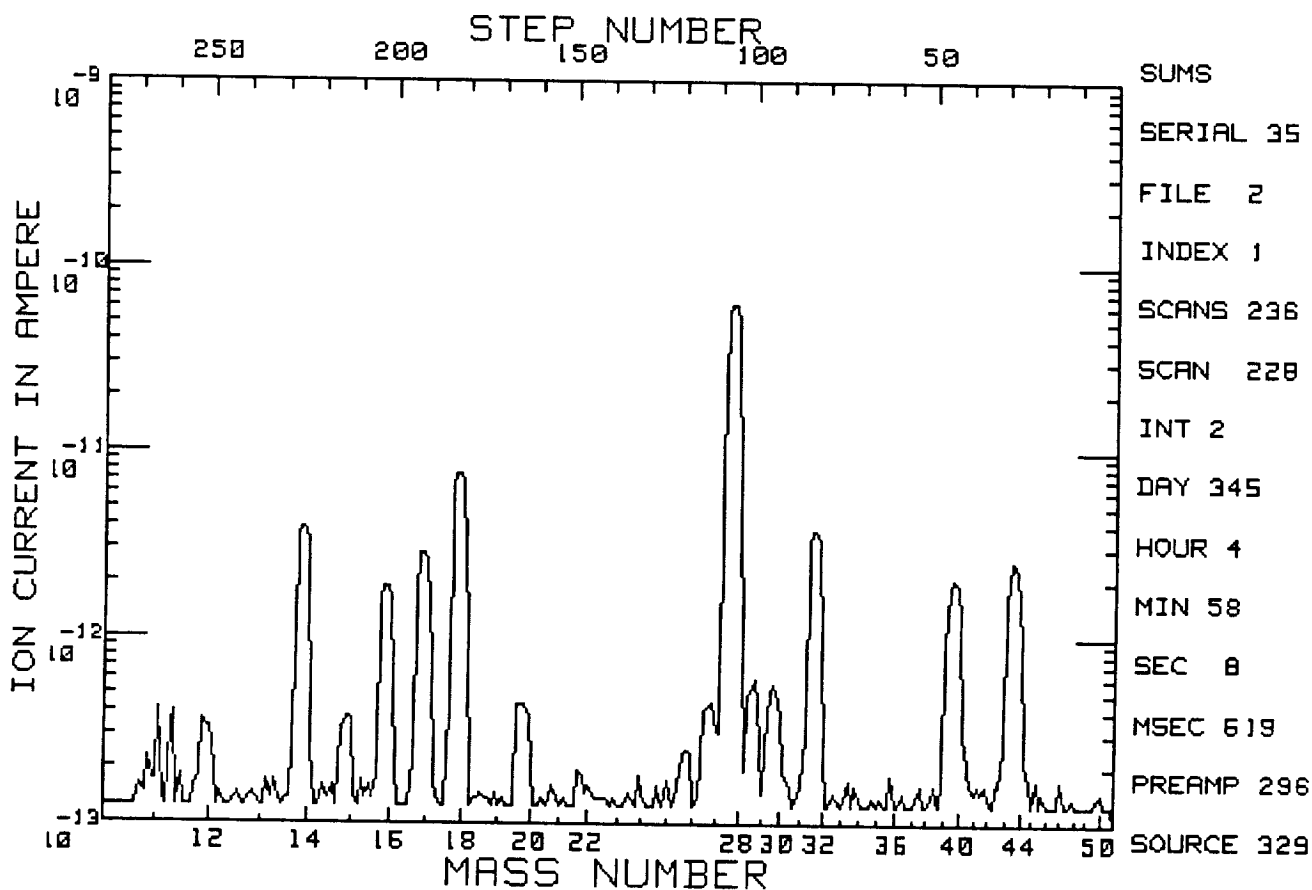
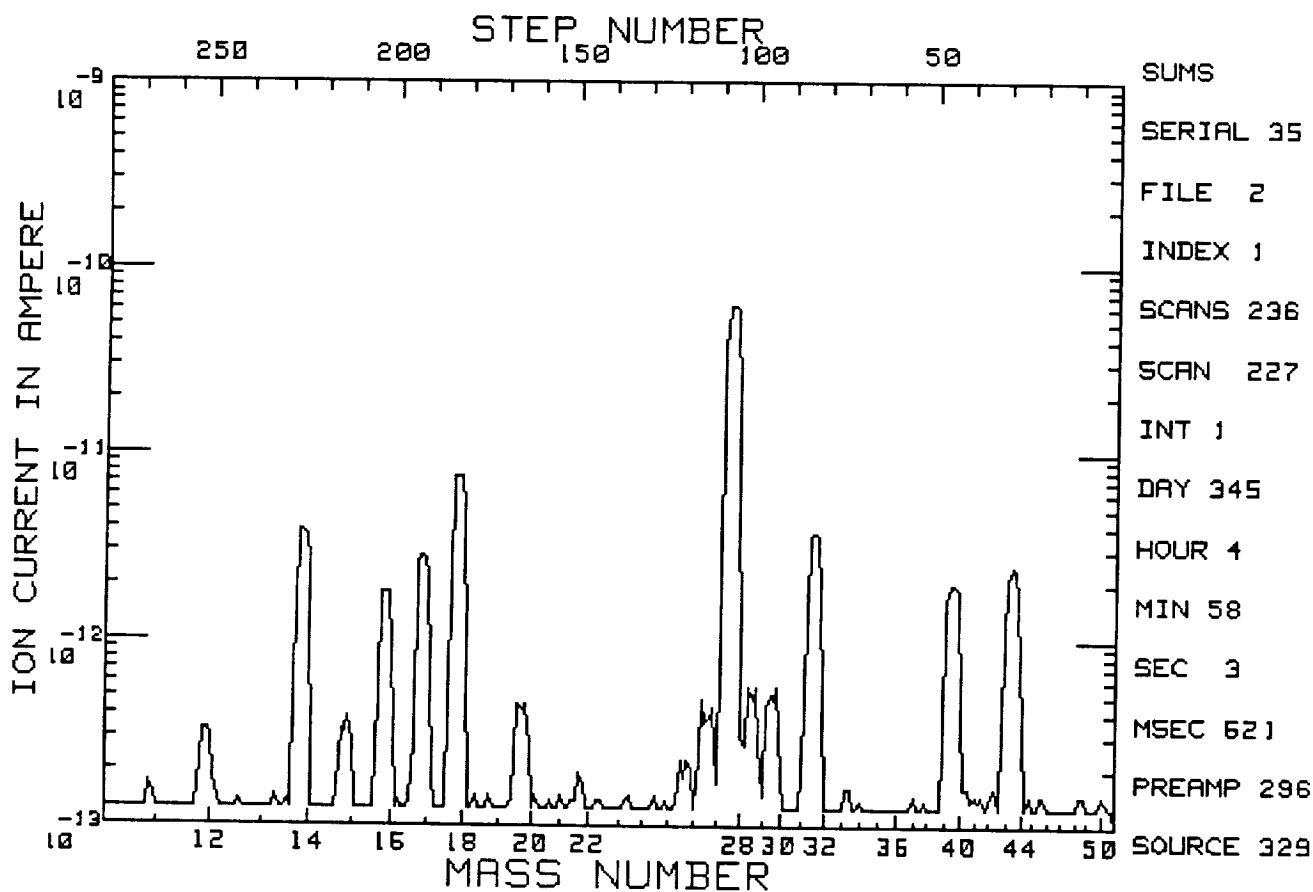


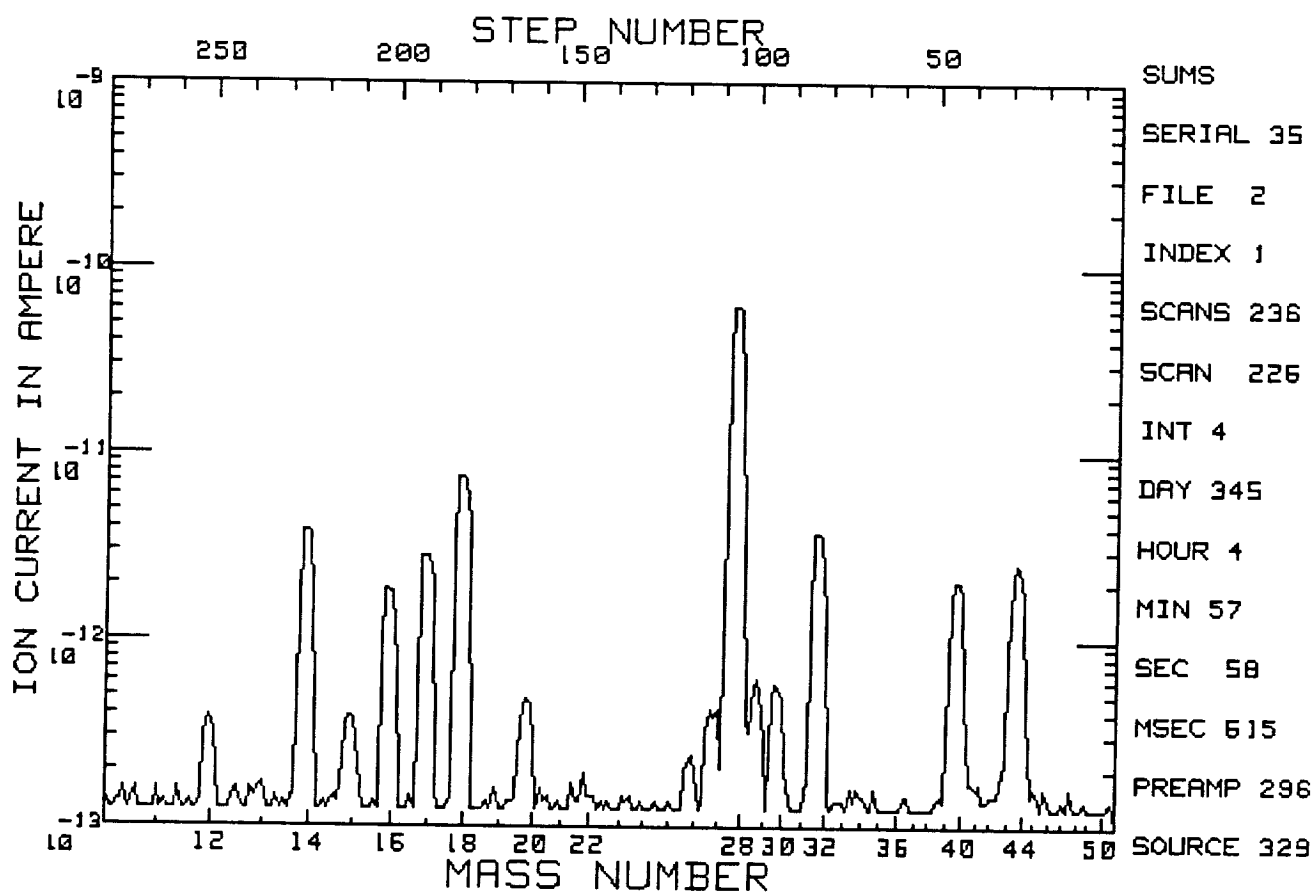
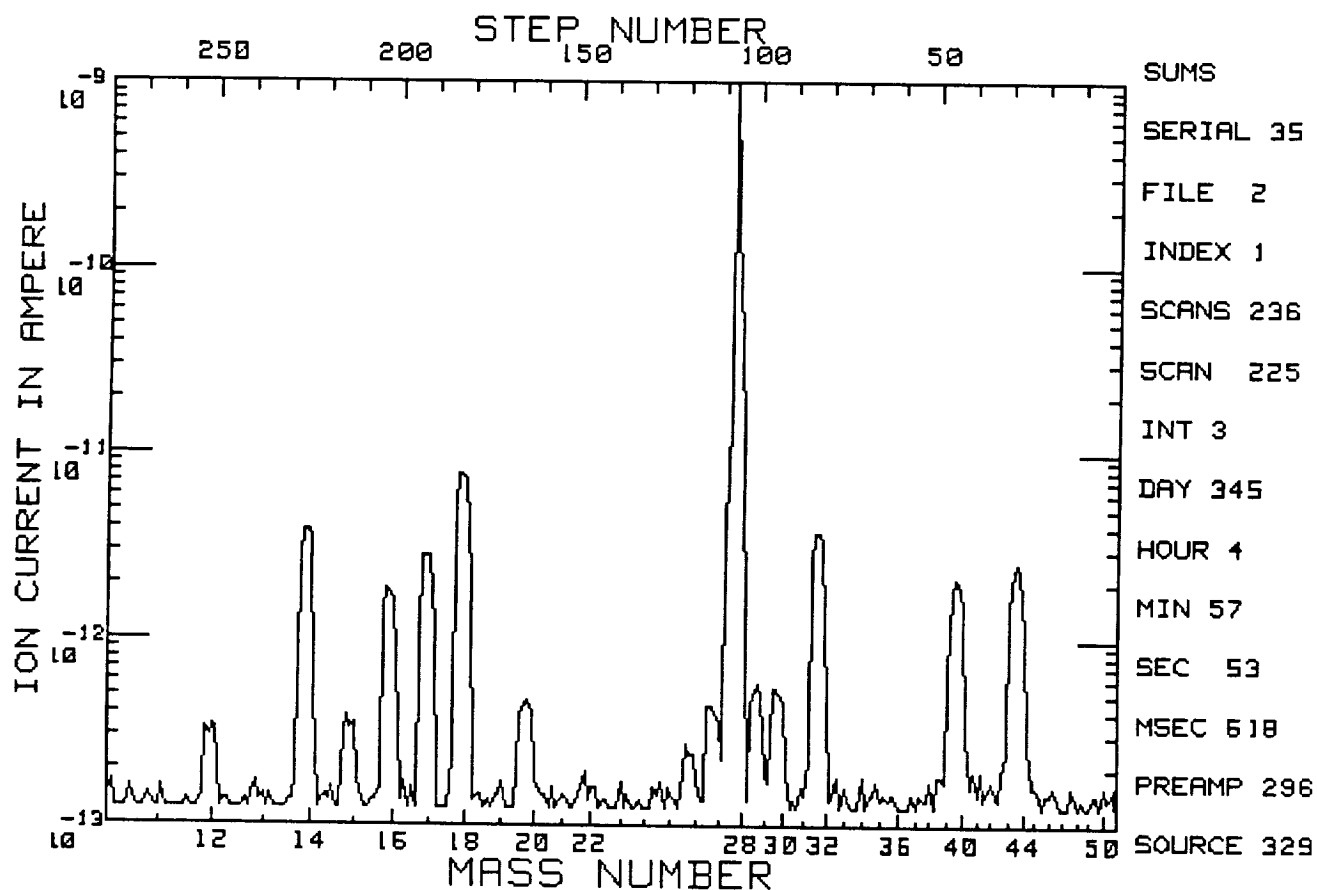


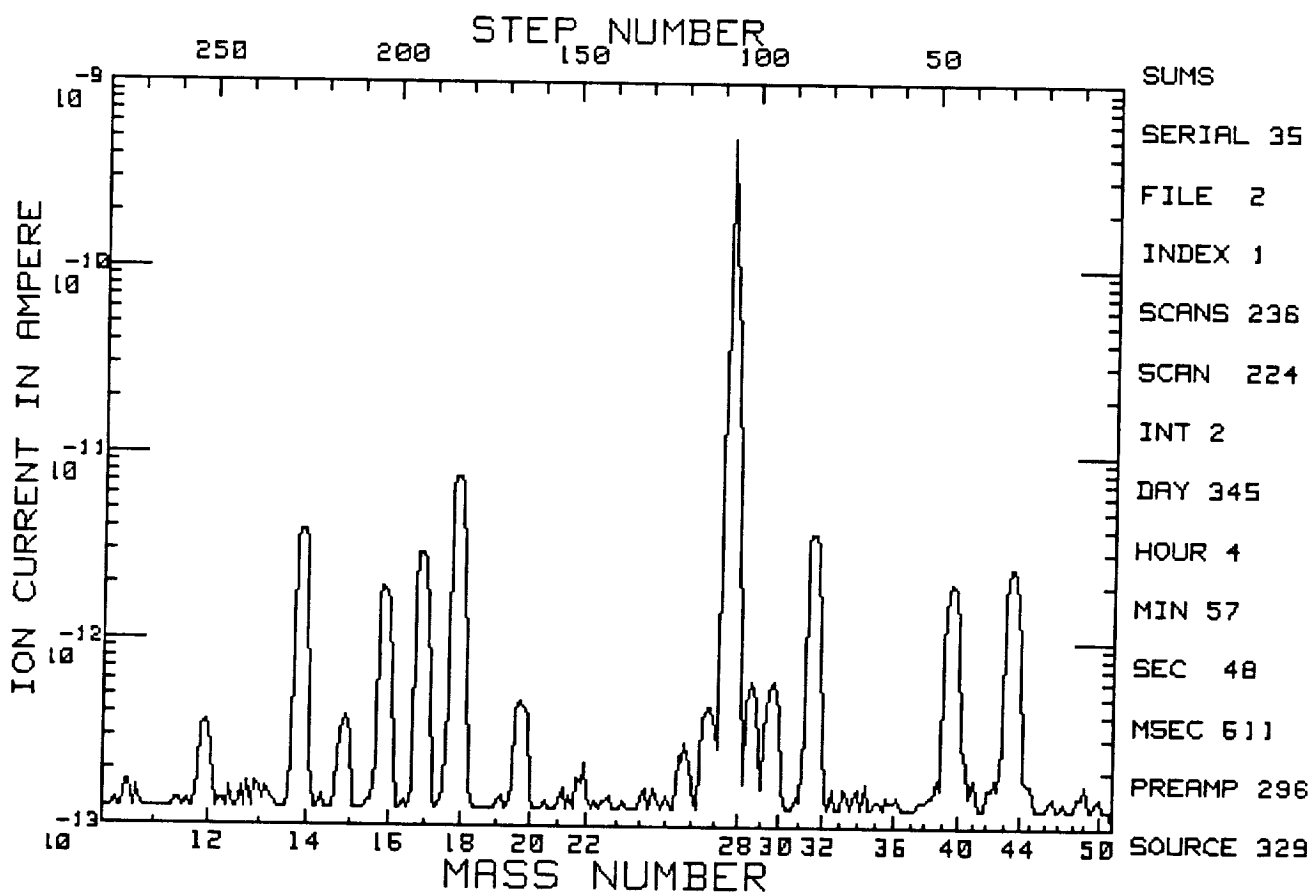
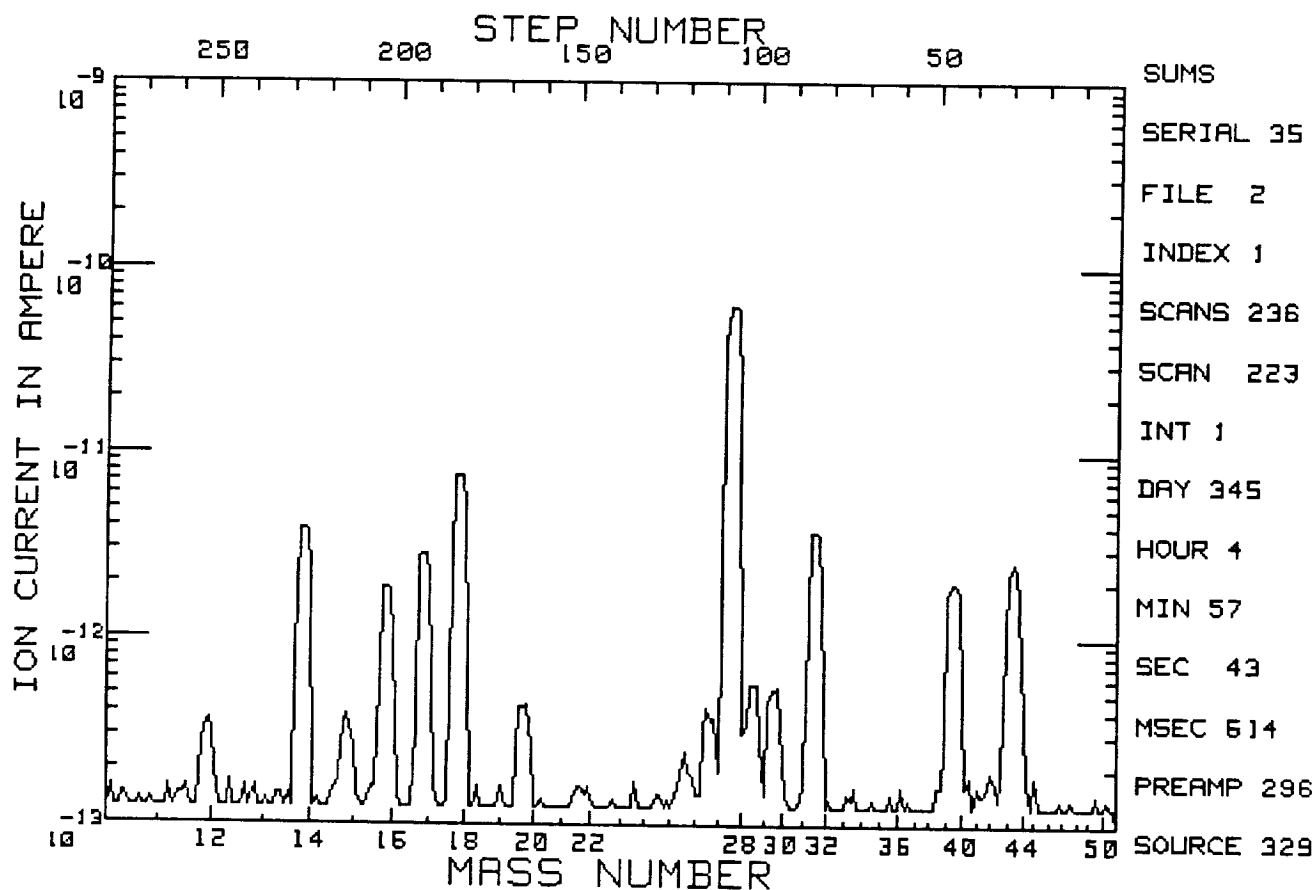












REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE May 1992	3. REPORT TYPE AND DATES COVERED Contractor Report	
4. TITLE AND SUBTITLE Support Activities to Maintain SUMS Flight Readiness - Volume 5 - Attachment B: Flight STS-35 Report (Section C)			5. FUNDING NUMBERS C NAS1-17399 506-48-11-03	
6. AUTHOR(S) Willie Wright				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) University of Texas at Dallas P.O. Box 830688 Richardson, TX 75083-0688			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) NASA Langley Research Center Hampton, VA 23665-5225			10. SPONSORING/MONITORING AGENCY REPORT NUMBER NASA CR-189656, Volume 5	
11. SUPPLEMENTARY NOTES Langley Technical Monitor: Robert C. Blanchard Final Report				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Unclassified-Unlimited Subject Category 19			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The Shuttle Upper Atmosphere Mass Spectrometer (SUMS), a component experiment of the NASA Orbital Experiments Program (OEX), was flown aboard the shuttle Columbia (OV102) mounted at the forward end of the nose landing gear well with an atmospheric gas inlet system fitted to the lower fuselage (chin panel) surface. The SUMS was designed to provide atmospheric data in flow regimes inaccessible prior to the development of the Space Transportation System (STS). The experiment mission operation begins about 1 hour prior to shuttle de-orbit entry maneuver and continues until reaching 1.6 torr (about 86 km altitude). The SUMS flew a total of three missions, 61C, STS-35, and STS-40. Between flights, the SUMS was maintained in flight ready status at the physics laboratory of UTD. The flight data has been analyzed by the NASA LaRC Aerothermodynamics Branch. Flight data spectrum plots and reports are presented in the Appendices to the Final Technical Report for NAS1-17399 as follows: Attachment A: Flight 61-C Report (Vol. 2) Attachment C: Flight STS-40 Report (Vol. 9) Attachment B: Flight STS-35 Report (Vol. 3, Vol. 4, Vol. 5, Vol. 6, Vol. 7, and Vol. 8) Attachment D: SUMS Software Listing (Vol. 9)				
14. SUBJECT TERMS Mass spectrometer, upper atmosphere, rarefied-flow aerodynamics, shuttle reentry			15. NUMBER OF PAGES	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT	